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ABSTRACT

The Work Group on Behavior Modification in Education, which issued this report, was authorized by Secretary Elliot Richardson on November 21, 1970. The body of this report includes an analysis of the benefits of behavior modification techniques in education, examples of their successful application with a variety of large student populations, an examination of the problems raised by the approach, an assessment of its readiness to receive widespread promotion, and recommendations of possible next steps that could be taken by U.S. Department of Health, Education and Welfare and the Office of Education relative to further research and dissemination. There are four appendixes. Appendix A contains a list of general references of basic literature in the discipline; Appendix B provides an overview of behavior modification activities in the range of educational settings; Appendix C lists selected materials available for instructing parents and teachers in behavior analysis techniques; and Appendix D consists of detailed reports of 15 major centers of activity in behavior modification. (Author/JA)

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FINAL DRAFT

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REPORT OF THE HEW WORK GROUP ON BEHAVIOR ANALYSIS IN EDUCATION

SP 006 614

September 3, 1971 and
updated January 1973

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I. PREFACE

The Work Group on Behavior Modification in Education was formed in order to carry out a directive from the Secretary, DHEW, "to evaluate fully the Behavior Modification approach and prepare a plan for its expansion."* The Work Group defined the first phase of its task to include an analysis of the benefits of the behavior modification approach, an examination of the problems raised by its techniques, an assessment of the readiness of the approach to receive widespread promotion, and finally, an elaboration of alternative sets of next steps to be taken.

While exploring behavior analysis in depth, the Work Group attempted to identify a number of educational "packages" or "products," such as training programs, texts, handbooks, etc. which after further evaluation might be judged candidates for dissemination by the Office of Education. Another important activity involved identifying major centers of behavior modification research and practice as potential components for a coordinated system of research and demonstration sites. Pinpointing the involvement of key individuals in the field was also regarded as prerequisite to the development of an effective plan.

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*Authorized by Secretary Richardson's approval of November 21, 1970, memorandum from ASPE on "Promoting new ideas that work." The Behavior Modification Work Group consisted of Professor Wells Hively, University of Minnesota; Joyce Stern, OASPE/DASEM; Beverly Kooi, OE/NCERD; and Judy Lamontagne, OASPE. The final report was written by Joyce Stern, under the direction of Robert Krughoff, Director of Researh and Development Planning, Office of the Secretary, with consultations from his staff and from other members of the Work Group. Individuals in the field whose advice and suggestions were solicited in the course of the preparation of this report are listed on pages iii and iv. Comments on an early draft were requested from members of the staff of OASPE, from Dr. Shlomo Cohen (Director, Behavior Modification Project, Anne Arundel County Learning Center), Dr. Daniel G. Browne (NIMH consultant), Dr. Walter Lebaron (DASEM consultant), and from Dr. Willard Zangwill, who, as Director of Education Evaluation, OASPE, first conceived of bringing the Behavior Modification Approach to the Secretary's attention. A review of the final draft was provided by Professor Jack Michael, Western Michigan University.

Finally, in response to limitations in the current state of knowledge about behavior modification identified as a result of the Work Group analysis, a research agenda was formulated for presentation to the Office of Education for consideration by the staff of the National Center for Educational Research and by the National Institute of Education Planning Unit.

The individuals listed below were contacted in the course of research by the Work Group. The Work Group is indebted to them for many ideas and suggestions which were incorporated within this report.

Teodoro Ayllon - Professor of Psychology, Georgia State University

Nathaniel H. Azrin - Director, Behavioral Research, Anna State Hospital

Wesley Becker - Director, Systematic Use of Behavioral Principles Follow Through Model, University of Oregon (Eugene)

Sidney Bijou - Professor, Department of Psychology, University of Illinois

Daniel G. Brown - Mental Health Consultant, NIMH, Atlanta, Georgia

Don Bushell, Jr. - Director, Behavior Analysis, Follow Through Model University of Kansas

Harold Cohen - Director, Experimental College, Institute for Behavioral Research (Silver Spring, Maryland)

Shlomo I. Cohen - Director, Behavior Modification Project, Anne Arundel County Learning Center (Fort Meade, Maryland)

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Roger Ulrich - Research Professor, Department of Psychology, Western Michigan University

Montrose Wolf - Associate Professor, Department of Human Development and Family Life, University of Kansas

NOTE: The titles and locations of the individuals cited above are those which pertained at the time they were initially contacted by the Work Group.

II. Summary

A. Findings

Behavior modification (or behavior analysis), while a relatively new science, is now well-established within the mainstream of modern psychology and is being applied with increasing frequency in the classroom. Its concepts and principles are derived exclusively from experimental research and are concerned with observable and measurable behaviors. The behavioral principles most widely applied in education today concern reinforcement and its relationship to the acquisition (or extinction) of behavior. Where desirable behaviors are specified and then appropriate reinforced, they have been found to increase in frequency. Similarly, when undesirable behaviors are not reinforced, they have been found to decrease in frequency.

Experiments employing behavior analysis were extended outside the psychologist's laboratory to problems that were socially significant only at the end of World War II. The first applications in classrooms for the retarded or emotionally disturbed occurred less than a decade ago. Today, some form of behavior modification is being implemented in hundreds of classrooms for the purpose of achieving a range of goals, such as: accelerated learning and a greater degree of individualization by teaching information, skills, and concepts efficiently through programmed instruction; structuring learning to stimulate motivation in children with educational handicaps; controlling deviant behaviors and decreasing problems of classroom management; increasing social skills and social interactions; increasing cooperation and individual responsibility; improving study habits; designing educational strategies

to permit the inclusion of children with social, emotional, or educational handicaps within regular classrooms. (The technique is also being used for rehabilitation and instruction in prisons, training centers for delinquents, and mental hospitals.)

The contributions of programmed instruction behaviorists are particularly well-known. Their pioneering work in accountability and in the specification of behavioral objects is now having considerable impact in education. Applications of individualized instruction and contingency management are being employed in schools and institutions throughout the country.

These wide-ranging applications have a common focus--shaping behavior through the systematic structuring of the environment. The success of any behavior analysis program is dependent upon the skills of the practitioner as a "behavioral engineer." A teacher, for example, becomes a manager of the classroom environment, specifically of the antecedents and consequences of learning. Each child in the classroom is rewarded for his progress toward particular, pre-determined objectives. His progress and the variables that affected that progress are precisely recorded. Depending upon the child, the rewards may be edibles, tokens exchangeable for prizes, or "natural reinforcers," e.g., reading (preferred activity) <u>after</u> spelling (less preferred). Such a conception is child-oriented and the ultimate goal is the creation of environments which promote individual success and ultimately, self-management.

Behavior modification has many of the limitations of a young science. In its applications to education, specifically, its long-term effects have not yet been explored. Studies typically have not followed children beyond a few years and have not explored possible unintended consequences. This limitation must be addressed, because many thoughtful psychologists and educators have voiced concern that behavioral techniques might produce undesirable long-term results or possibly unplanned harmful side-effects in its focus on an individual's manifest behavior rather than

on the internal mental processes which underlie learning. Their basic question is, "What are the effects on such desirable characteristics as curiosity, initiative, creativity, independent thinking and intrinsic motivation of applying systematic reinforcement techniques as a primary instructional method?" Acknowledging that longitudinal studies are still to be done, behaviorists contend that despite difficulties of measurement, these characteristics can be enhanced through appropriate application of behavioral principles. Many practitioners are currently addressing these very questions.

Furthermore, the need to examine long-term effects is not a problem unique to behavior analysis. Longitudinal analyses of current practices have not been done and it would be desirable to submit other educational approaches to the hard scrutiny advised for behavior analysis. The task would be an admittedly difficult one. Administrative dissatisfaction with on-going longitudinal studies of Head Start and Follow Through may be considered illustrative of the conceptual and technical problems to be encountered in the conduct of such studies.

Recognizing the need for further examinations of these questions, the Work Group nevertheless identified a wealth of case studies and evaluations to support the claims of behaviorists for the efficacy of their approach in the classroom and elsewhere. Its findings include the following:

1. A large variety of efforts across the country are effectively employing techniques of behavior analysis in settings ranging from nurseries to old age homes.

2. Although behavior analysis was originally employed in classrooms for the handicapped and as a remedial technique, and is still largely confined to "special-education" settings, e.g., for the slow learner or the educationally disadvantaged child, headway is being made in its extension to regular classrooms.

3. Materials for instructing parents and teachers in its principles and procedures were scarce in 1968 but plentiful by 1971.

4. Several behaviorists have developed highly refined in-service teacher training strategies. A number of universities are offering pre-service teacher-training in reinforcement theory and applied behavioral analysis. A few places have even developed a strategy for training principals or other administrators in these techniques.

5. There is a great deal of work at the pre-school and elementary school level; data on efforts at the secondary school and college level are still relatively scarce.

6. The approach represents one of the important educational strategies available today.

B. Recommendations

The Work Group recommends that HEW recognize the potential of the behavioral approach. Accordingly, HEW should research the approach thoroughly and make findings available to school districts. Those school districts which choose to adopt the approach should be given HEW assistance in fully understanding it and making it work. This should not preclude comparable HEW efforts with other promising strategies. The Office of Education should be assigned responsibility for generating and analyzing a set of next steps for the Department in the area of classroom applications of the behavior analysis approach. Possible steps which the Office of Education might consider are summarized below.

1. Classroom Applications

a. Conduct a comprehensive evaluation of representative behavior modification programs in the classroom.

b. Support demonstration schools and school systems to serve both as models with a technical assistance capacity to export the model and as research centers designing and testing curriculum, measurement, and new organizational patterns.

c. Evaluate the major pre-service and in-service teacher training programs, courses and materials to identify models to be supported by OE.

d. Determine the extent and quality of efforts to "pinpoint" non-behavioral instructional materials which are widely used in school systems throughout the country. Encourage publishers of these materials to develop schemes for adapting them for use in behaviorally designed classrooms. If demand and supply warrants, make the adaptations available through a special purpose clearing house or some other easily accessible information system.

e. Develop a handbook on models of classroom behavioral applications for school administrators.

f. Promote an awareness of the behavior analysis approach on the part of OE managers of discretionary funding sources.

2. Research Activities

The Work Group has suggested areas where additional research and development efforts are needed in the applications of behavior analysis to educational settings.

a. Longitudinal Analysis
b. Follow-Up Evaluation
c. Examination of Secondary Effects
d. Maintenance of Acquired Behavior
e. Interrelationships of Target Behaviors
f. Research on Teacher Behaviors
g. Adaptation of Available Materials for Public Education
h. Domain-Referenced Testing
i. The Social Psychology for Small Groups

III. BACKGROUND ON THE BEHAVIORAL APPROACH

A. What is Behavior Analysis?

Behavior is influenced by its consequences. This simple proposition is a basic principle of a major school of modern psychology which seeks to understand and analyze the relationship between the environment and a given behavior.* Psychologists know the field as "the experimental analysis of behavior," "social reinforcement theory," or "operant conditioning." The application of the principles of behavior outside the laboratory to problems that are socially significant is known as "applied behavior analysis," or simply "behavior modification." (Non-psychologists, and educators in particular, presently employing related procedures use terms such as "contingency management," "accountability," and "incentive application" to describe their activities.)

The basic experimental procedures first developed in the laboratory by E. L. Thorndike and later by B. F. Skinner, have been applied with increasing refinement and success in the last fifteen years to a number of human behavior problems. Applications entail using environmental contingencies to build and maintain behaviors defined as desirable and to weaken unwanted behaviors. Generally, this means that desired behaviors are defined so that they can be clearly recognized and recorded, conditions that are likely to encourage those behaviors are arranged, and rewarding consequences are made to follow the behaviors when they

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* Appendix A contains a list of general references that describe the field.

do occur. Applications extend to virtually any situation which involves problems of motivating and governing human behavior.*

In view of how readily behavior may be altered by the environment, behaviorists make little use in their procedures of diagnostic categorizations related e.g., to brain dysfunctions and are equally skeptical of current measuring devices of intelligence and even of the concept of intelligence itself. They regard labels and I.Q. scores as of little value in predicting future performance. Instead, operant educational psychologists assess existing performance and then structure the environment to alter that performance.

B. Principles of Behavior Analysis

In observing apparent consistencies in behavior, Skinner and his colleagues articulated certain principles which are essential to the understanding of any behavior modification program. The first principle is that voluntary behavior is molded by the events that precede and follow it. A student, for example, will be more likely to read if (a) he has a regular time and place for study and (b) he is rewarded for reading.

Whatever consequence increases the frequency of a behavior is by definition a "reinforcer" or simply a reward. Parental approval and satisfaction could, for instance, constitute reinforcement for reading. Numerous studies have shown selective attention or praise to be effective conditioned reinforcers, and, of course, money is a reinforcer that is familiar to everyone.

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*Appendix B contains summaries of behavior modification activities in the following major categories: 1) mental illness, retardation, and special education; 2) learning disabilities and compensatory education; 3) physical disabilities; 4) delinquency; 5) normal education, including preschool, elementary, secondary and college applications.

The timing of reinforcement or the "reinforcement schedule" is a crucial variable in a behavior modification program. To most quickly build a new behavior, continuous and immediate reinforcement is necessary. Once a behavior has been learned, however, it can be maintained by intermittent reinforcement. Intermittent reinforcement has advantages over continuous reinforcement: it may be impractical or time-consuming to maintain a high density of reinforcement, e.g., when the reinforcer is play time or a field trip; continuous use of a reinforcer may cause satiation so that the reinforcer loses its effect; intermittent reinforcement will produce a behavior that is more persistent in the face of extinction than that which results from continuous reinforcement and is therefore useful when the eventual discontinuation of the use of reinforcement is planned or when long periods in which the reinforcer will not be provided are anticipated. A learned behavior, of course, may acquire reinforcing properties of its own. Thus, if a behavior such as reading has become intrinsically rewarding, it will remain without the need for the extrinsic reinforcers that helped to establish it.

Frequently, it is not possible to obtain an optimal performance without <u>gradually</u> building toward that terminal behavior, a process known as "shaping." For example, a child who "never does any work," is at first rewarded for simply being at this desk, then for holding his pencil and finally for properly using it to do his assignments. In this strategy, the sequence of desired behavioral components is carefully identified or "pin-pointed" and each step is reinforced until the goal behavior is achieved.

The absence of reinforcement will cause the strength of a behavior to decrease and suffer what is termed "extinction." For example, researchers have found that ignoring an undesirable behavior (providing no reinforcement) can effectively eliminate that behavior if care is taken to build the productive counterpart behavior simultaneously. A child who aimlessly wanders around the room during a study session might be systematically ignored, but consistently rewarded when he works at his seat. He will soon spend more time in his seat.

Classroom behavior analysis programs eschew techniques of punishment that are ineffectual or that raise other problems. For example, an event such as scolding, viewed by an adult as mild punishment, may actually constitute a form of attention and reinforcement for some children and thus serve to maintain the very behavior the parent or teacher seeks to eliminate. Severe punishment, on the other hand, may suppress a given behavior, but frequently with undesirable side effects such as hostility or attempts to avoid or escape the punisher. The punishing techniques that are employed in behaviorally designed classrooms to weaken disruptive behavior include "time out" (the removal of a disturbing child for a brief period of time), "response cost" (the denial or lessening of an otherwise available reinforcer), and unpleasant requirements such as having to clean up one's mess or having to perform a remedial activity. However, the major focus in classroom behavior modification programs has been on building productive behavior through reinforcement procedures. Consequently, the majority of current research and practice has emphasized the systematic and proper use of positive rewards.

of gold stars may be made contingent on precisely defined task-oriented behavior--in one class period at a time. The effect of the reward during the first period is measured, then its effect during the second period and so on until the impact of the variable is fully demonstrated. Such reliance on objective data and the ultimate "testability" of the researcher's procedures and conclusions are the major contributions and advantages of behavior modification as an intervention technique. 1/

D. The Growth of Behavior Analysis

The first formulation of reinforcement theory and operant experimental methodology, Skinner's The Behavior of Organisms, was published in 1938. His 1953 publication, Science and Human Behavior, contributed to the up-surge of interest and research activity that characterized the decade of the 50's when the basic laboratory procedures were delineated. In the 1960's research results began to be used widely in therapeutic situations. Ninety percent of the reported applications employing parents and teachers as therapists have occurred since 1966, with two-thirds of such applications taking place only in the last three years.* The applications of behavior analysis are now reported by some dozen journals, its proponents are represented not only in departments of psychology but in schools of education as well, and it is the subject of ambitious conferences and symposia across the country.

1/ Benson, F. Arthur M. (Ed.), "Modifying Deviant Social Behavior in Various Classroom Settings," Monograph No. 1, Department of Special Education, College of Education, University of Oregon, Eugene, Oregon, 1969, p. 9.

* See Brown, Daniel O. Behavior Modification in Child, School and Family Mental Health: An Annotated Bibligraphy on Applications with Parents and Teachers and in Marriage and Family Counseling. Research Press Co. Champaign. 1972. Preface

E. Programmed Instruction

The related field of programmed instruction (PI) also mushroomed in the last decade. Skinner initiated the concept of a "teaching machine" in his 1954 article, "Science of Learning and the Art of Teaching". The programmed text is designed to promote learning through the same stimulus-response paradigm without the machine.

During the 60's, many Federal agencies were attracted by the idea promoted by the programmed instruction behaviorists that a behavior analysis could be developed to yield a standard program with predictable results. The development of techniques associated with doing such an analysis --of which the preparation of behavioral objectives to specify in unambiguous terms exactly what the student should be able to do at the end of the learning exercise-- remains a major contribution of PI.

While several early programs were particularly successful in the areas of technical training and in the design of basic educational systems for the educationally disadvantaged, programmed instruction per se, was not an unqualified success. Many students complained that they were boring. The concepts behind PI were sound: self-pacing, small steps, high frequency of student response, immediate confirmation. However, the original "linear approach" which used a classical ccnditioning presentation involving a system of prompting and fading, generally resulted in long, tedious programs which relied heavily on over-learning to produce results.

To correct this, the "branching" technique propounded by Dr. Norman Crowder, was adopted. In branching programs, the step-size is greatly increased, shortening the program but increasing the chance for student error. When the student does make a mistake, he is directed to an alternate presentation. "Skip-ahead-if-you-know-this-material"

C. Experimental Procedures of Behavior Analysis

Two experimental designs are most frequently used to evaluate the effects of behavior modification programs.

In the first, an ABAB design, data are recorded prior to the experiment to determine the pre-treatment strength of a given behavior (A). Subsequently, behavioral data are recorded under treatment conditions (B). To confirm the impact of the experiment, pre-treatment conditions are reinstituted (A), followed by a return to the experimental condition (B). For example, the number of words correct on a weekly spelling test may be noted over a period of several weeks (baseline data). A new variable, e.g., a minute extra recess for every correctly spelled word, is then introduced and scores are recorded for a similar period of time. A "reversal" or return to pre-treatment conditions, followed by a resumption of the experiment provides strong evidence of the real impact of the new variable. (One would expect scores to rise under the experimental condition and to fall when reinforcement is removed.) Follow-up observations determine the long-term effects of the variable.

A second procedure is described as the "multiple-baseline" design. Initially, data are recorded for several behaviors. Experimental conditions are then introduced successively for each individual target behavior or for the same behavior at different times to determine if, indeed, the new variables are bringing about behavioral change. For example, with a disruptive group of students, reinforcement in the form

options were also incorporated, and multi-level programs were developed which provided for individual differences in the need for redundant materials. The multi-level program which employs a combination of text with linear exercises is rapidly becoming the standard.

IV. EVALUATION OF THE BEHAVIORAL APPROACH IN THE CLASSROOM

A. General Classroom Procedures

Since the beginning of serious experimental classroom applications within the last ten years, behavioral psychologists have employed behavior analysis procedures in hundreds of classrooms across the nation. The effective use of these procedures in special classes for retarded or disturbed children suggested the wisdom of instituting them in regular classrooms as well to increase precision and speed in improving classroom management, to stimulate student motivation, and to facilitate the acquisition of specified academic skills.* This work has consistently exhibited several characteristics which, collectively, currently define the field.

Whatever behavior is of concern, it is objectively measured. The emphasis on measurement requires that the target behaviors be precisely and objectively defined. A child's "feelings of indifference toward his school work" do not provide for direct measurement. However, teachers can and have dealt with how often a child smiles, talks back, interacts with a teacher and completes his assignment. The focus on observable behavior is what makes measurement possible.

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*A feel for the extent and range of classroom interventions may be gained through an examination of Appendix D, "Centers of Activity." Note that the seventy-fifth yearbook of the National Society for Studies in Education (NSSE) will be devoted to a review of the current state of behavior modification applications in the classroom.

To date, much of the classroom research conducted from a behavior analysis viewpoint has been aimed at determining what kinds of student-environment interactions are rewarding and which are aversive. As the catalog of effective rewards and punishments has grown, researchers have turned more to developing comprehensive classroom systems based on rewards. These have emphasized three general kinds of rewards--each with some advantages and disadvantages. The first takes advantage of the fact that a teacher's attention can be a tremendously effective motivational tool, and trains the teacher to give attention to desired behavior. In ordinary classrooms, some teachers are only minimally efficient in using their attention to help their students. A typical teacher will interact with her students several hundred times a day and each of these interactions will strengthen some behavior. Too often it is a useless or disruptive behavior. Several researchers are consequently concerned with developing effective ways to train and supervise teachers in the systematic use of their attention to students.

A second class of reinforcer is the token economy. A student receives an inherently valueless token or point as an immediate reward for an approved behavior. Tokens can be later exchanged for toys, special privileges, or access to peers or play. In essence, this technique is based on establishing and controlling a currency.

The third kind of reinforcement permits a child free time or access to peers and play as a reward as soon as he has completed a unit of work at a certain quality level. In employing both of these last reinforcers, the teacher is also trained in the appropriate use of her attention.

Classroom applications of behavior analysis are largely oriented toward the progress and achievement of the individual student. They thus rely in varying degrees on the use of programmed materials which are designed for self-pacing and individualization. Programmed materials have been employed in regular classrooms for several years. It is the use of this mode of instruction in combination with teaching and classroom management procedures which provide reinforcements in addition to the materials themselves that distinguishes a fully behavioral managed classroom.

The behavioral stress on measuring observable behavior, both academic and social, has several important by-products. The first of these is precision in evaluation.* The use of objective measurement to determine the effect of a given educational practice opens up the

*That evaluation is a major strength of the behavioral approach is seen in a recent study for the Office of Education's Office of Program Planning and Evaluation by the General Learning Corporation to identify "exemplary" programs for emotionally disturbed children. Eight of the twelve programs so identified are behavioral in nature. In addition to their demonstrated excellence, a major reason for the proponderance of behavior modification programs among those selected is that these programs kept data that related techniques to outcome. General Learning found many projects that seemed to be working, but that lacked hard proof of their effectiveness. Even without adopting behavior modification as such, educational and remedial endeavors of every variety couldgreatly benefit from the behaviorist stress on a quantitative evaluation design both to promote continual up-grading of a given project and to permit replication of a "good" program.

possibility of real comparisons among different teaching strategies.* It also offers an opportunity for the implementation of the theory of accountability, whereby teachers and other participants in the educational process are held responsible for students' progress in attaining desired outcomes. The behavior analysis approach, in which conditions are arranged to direct the student toward clearly-defined goals, is based on the same kind of cause-effect relationship which is the essence of accountability.

The cause effect components of behavioral practice also provide an environment which is amenable to the implementation of performance contracting, in which outside providers of educational services are reimbursed by the local education agency according to the objectively measured performance of students they have contracted to teach. The elements which are essential to the execution of a performance contract, i.e., statements of measurable goals, methods of directing students toward those goals, and techniques for objectively measuring student progress, are already present in the behavioral approach to classroom management.**

The practice of educational consumerism is also facilitated in a behavioral classroom. Precise definition of goals, procedures and outcomes of instruction gives parents and educational interest groups

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*Much of this general description of classroom applications has been excerpted with permission from an untitled paper by Dr. B. L. Hopkins of the University of Kansas.

**The Work Group was not able to examine the extent to which contractors employ scientifically-based behavior modification techniques. An exhaustive examination of operating programs in performance contracting and an evaluation of the state of the art is being completed by the RAND Corporation for HEW/Office of Education.

the opportunity to obtain an exceptionally clear picture of the nature of the education which is being offered. In addition to offering the parent some straightforward information* on which to exercise his options, in a voucher system for example, this approach also opens the door, perhaps more than some groups will like, to community participation in setting educational goals.

B. Benefits in the Classroom

Many behavioral applications in the classroom have effectively reduced unproductive, disturbing or harmful behavior while promoting gains in productive behavior, e.g., task orientation and performance on achievement tests. References to many of the varied classroom applications appear in Appendices B and D. Data on classroom improvement, including learning gains as measured by standardized tests, are cited below for several on-going programs.

1. For the last three years, Dr. Roger Ulrich of the Behavior Research and Development Center of Western Michigan University has operated a 75-pupil private school, "The Learning Village," where an integrated and comprehensive application of behavior methodology is employed in the total educational process. Students range in age from early infancy through the upper elementary grades and attend school all day on a year-round basis. The population is equally divided between black and white, poor and advantaged children. Several attend with financial assistance. A ratio of five students to every teacher (3-1 in the infant nursery) has been achieved expeditiously and with potential economy

*A parent may or may not agree with the objectives which a teacher sets, but at least he can find out what those objectives are.

through "education pyramiding." University professors at the Ph.D. and M.A. level train graduate and undergraduate students who in turn do their practicum in the school and train parents, high school student-teachers, parents, and even the students themselves, the office help, cook and bus-driver in behavioral procedures.

The cost of the program is high, about $4,500 per child, largely because the project is experimental, operates all day, on a year-round basis, and involves extensive curriculum planning, an elaborate evaluation design, and a large, innovative training program. These costs are presently being separated out from basic program costs to devise a plan for increasing the student population of the Village by 50% this coming fall. It is tentatively estimated at this writing, that the essential program operation could be replicated for about $1,200-$1,500 per child. Ulrich is currently developing a design for such replication.

An exhaustive, long-term evaluation of the present Learning Village program was initiated in 1971 and available test results are encouraging:

a. In the spring of 1970, the Wide Range Achievement Test was administered to the Village's 18 kindergarteners.* Two children are shown reading at the fourth grade level and five are reading at the third grade level. Even those who scored lowest, place well into the first grade. All but one child ranked in the

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*Some had had two years in the program, others only one year. SRA (Science Research Associates) materials were used in both math and reading.

90th percentile or above. In the table below, disadvantaged children attending the Learning Village on full or partial scholarship are indicated with an asterisk. All of these children placed in the 90th percentile in reading.**

Table 1

Child	Years in Program	Age	Reading		Math	
			Grade Level	Percentile	Grade Level	Percentile
K1	1	4-11	2.5	99	1.8	98
K2	1	5-0	1.4	90	1.4	90
K3*	1	5-1	1.4	90	1.2	82
K4	1	5-3	2.5	99	2.1	99
K5	1	5-5	1.7	97	1.8	98
K6*	1	5-5	1.4	90	1.0	90
K7*	1	5-10	2.5	99	2.2	99
K8*	1	7-1	3.8	95	1.9	39
K9	2	5-7	2.6	99	2.4	99
K10	2	5-10	4.2	99	1.9	96
K11*	2	5-11	1.6	90	1.4	82
K12*	2	6-1	3.0	99	K.9	34
K13*	2	6-1	2.3	96	1.0	39
K14	2	6-2	3.1	99	2.1	92
K15	2	6-2	3.9	99	2.4	97
K16	2	6-4	4.2	99	2.8	99
K17	2	6-6	1.7	53	1.0	21
K18*	2	6-7	3.6	99	1.9	63
Mean		5-9	2.6	89	1.7	63
Median		5-10	2.5	99	1.8	69

** There is some problem in interpreting these results, however, since the Wide Range Achievement Test tends to yield scores which are considered by some experts to be less reliable and more susceptible to "teaching to the test" than those from some other tests, e.g., the California Achievement Test.

b. An Experimental Nursery School at the Western Michigan University preceded the founding of the Learning Village. The University also hosted the Campus Nursery School which used a traditional approach to early childhood education and which was attended primarily by children of the University's faculty. At the end of the nursery school year, about half of the parents of the Experimental School children decided to have their children stay in what became the Learning Village and half of the parents chose to send their children to public school. Children of lower and middle to upper socio-economic status were essentially equally represented in both groups. In spring, 1970, three sub-tests of the Wide Range Achievement Test were administered to children who had attended one of these nursery schools and who had then gone on to either the Learning Village or to a public school for kindergarten.

Table II, below, shows that Learning Village children achieved a mean reading rank above the 90th percentile and placed at the beginning of the third grade. In math and spelling, they ranked above the 70th percentile with mean scores placing them at the end of first grade.

Both groups of public school kindergarten children, by contrast, placed near the 45th percentile in reading, ranking in the early months of first grade. In math and spelling, they scored around or below the 50th percentile with mean grade level scores falling near the beginning of the first grade.*

*The data also show findings consonant with other research results, i.e., that children attending regular public schools are able to "catch up" with children who have had a "head start." In this case, however, the final similarity of scores for both groups of public school children may also be attributed to the overall higher social and economic status of the Campus Nursery School children and, to some extent, to the superior public schools they subsequently attended.

Table II
Wide Range Achievement Test Placement

Experience	Reading $\bar{X}$Grade Level	Reading $\bar{X}$Percentile in Age Group	Math $\bar{X}$Grade Level	Math $\bar{X}$Percentile in Age Group	Spelling $\bar{X}$Grade Level	Spelling $\bar{X}$Percentile in Age Group
Experimental to Learning Village	3.2	93.64	1.78	72.20	1.68	73.80
Experimental to Public School	1.22	44.20	1.25	45.00	.98	30.71
Campus Nursery to Public School	1.25	45.70	1.37	54.40	1.07	42.10

c. Tests in the sping of 1971 reveal a continued trend toward accelerated learning at the Learning Village. The Boehm test of Basic Concepts assesses mastery of 50 basic concepts likely to be encountered by a child in early elementary grades. Of the 14 kindergarten and first graders taking the test, only three scored below the 90th percentile and even the lowest scores were in the 60th percentile. Five out of the seven children from lower socio-economic backgrounds as determined by place of residence, placed above the 90th percentile.

d. The Gates-MacGinitie Reading Tests, designed to obtain an in-depth measure of vocabulary and paragraph comprehension, were also administered to the Village's elementary school-age children in the spring of 1971. Table III on the next page depicts the data. Each child is represented by three bar scores. The first bar

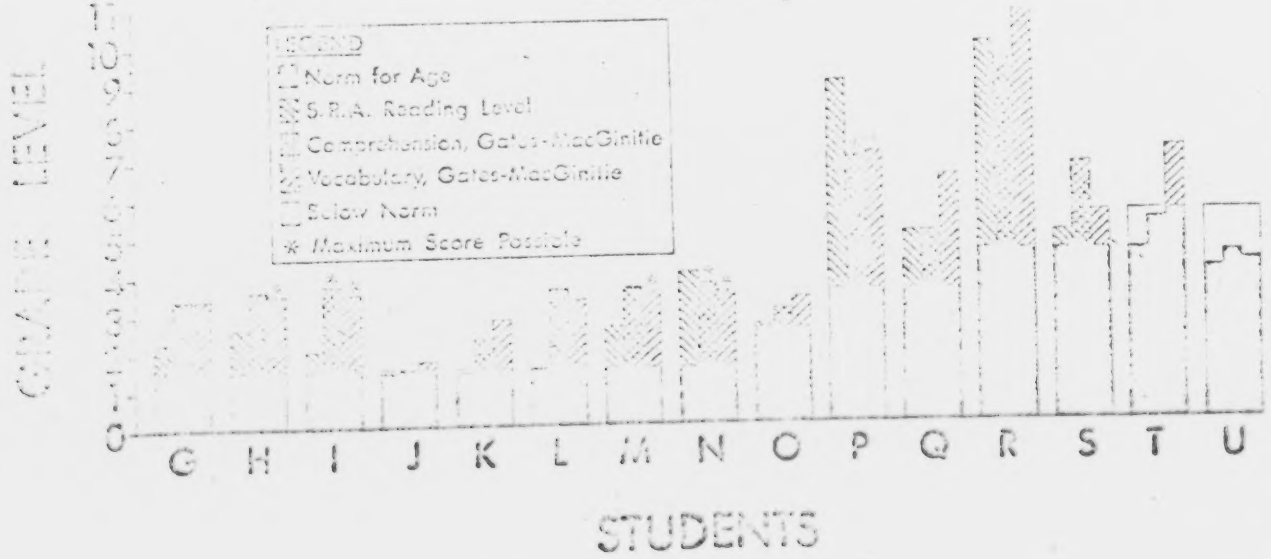
Table III

Gates-MacGinitie Reading Test, Multiform

From Age 6 yr. 3 mo. to 10 yr. 9 mo.

Learning Village

Elementary



indicates his level in a Science Research Associate Curriculum (Power Builders). The second bar represents the child's level on the comprehension portion of the Gates-MacGinitie Test. The last bar indicates his level on the test's Vocabulary portion.

The data show five children achieving maximum scores on one or both portions of the Gates-MacGinitie test. Most of the first grade children scored well above the norm, none scored below grade level and all placed higher on the test than their curriculum placement. Data on older children are more variable. Those ranking lowest, however, only entered the program that year and came with marked deficits.*

It should be noted that this record of academic achievement is accompanied with a great deal of anecdotal information and questionnaires answered by parents and visitors from the fields of education, psychology and mental health affirming the spontaneity, individuality and cooperative nature of the Village's students. Their observations indicate the Village's program has encouraged the development of apparently "happy, socially adjusted" children who also excelled academically.

2. The Behavior Principles Structural Model of Project Follow Through** is jointly directed from the University of Oregon by Dr. Wesley Becker who, in the late 60's, conducted several critical

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*For example, child "U" entered the Learning Village after four years in public school and placed at second grade in the SRA curriculum. That he gained two grade levels in seven months at the Village is viewed as a predictor of continued acceleration next year.

**This program was initiated in 1968 with 2,000 children. In academic year 1971-72, the program served 9,300 children.

experiments in applying reinforcement principles in the classroom, and Siegfried Englemann, designer of DISTAR, a programmed instructional system, developed specifically for disadvantaged children.

The Becker-Englemann Model applies the DISTAR system and relies heavily on an enlarged, well-trained staff and parent involvement. DISTAR was built on the premise that all children can learn if they are taught in the right way. Each curriculum--language, reading and arithmetic--is designed to teach basic concepts at an accelerated pace to permit children who start behind average students to catch up. Immediate feedback, praise and encouragement by the teacher as well as tangible reinforcers when appropriate* serve as incentives to the children and structure an orientation toward success.

Costs vary among sites and are considerably more in metropolitan areas where salaries are substantially higher than in rural areas. On the average, however, the estimated cost per child for a classroom of 25-30 children above a district's basic maintenance cost is $300-$325. This estimate includes staff training and supervision, salaries for two aides, materials, testing, data collection and evaluation.

a. Prior to its use in Follow Through, the DISTAR program was employed in Head Start and other pre-school projects and was

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*Tangible reinforcers are faded out as soon as possible and are rarely used once the program is fully operational.

independently evaluated.* Evaluations have included observations on adjustment as well as achievement measurements. One study used teacher ratings, parent reports and direct observations to conclude that the data did "...not support the view that the Bereiter-Englemann Preschool** program produces emotional or adjustment problems among children. If anything, the hypothesis is warranted that the Bereiter-Englemann Preschool program may contribute more to the adjustment of children in the Regular kindergarten program than does the Enrichment preschool program." 2/ Similar observations were ventured by school psychologists, testing children at a Follow Through site in Dayton, who commented that children in the Becker-Englemann program showed "a poise, self-confidence, and an

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*For example, in 1968, the Office of Economic Opportunity contracted for a study of pre-school and kindergarten programs in Grand Rapids, Michigan. At the end of the pre-kindergarten year, IQ tests were administered to disadvantaged children in a Head Start program using the Englemann program, to children in a Head Start Enrichment program and to a Control group receiving no instruction. Children in the Englemann program scored one full year above the norm (IQ=111.7); children in the Enrichment program were at age level (IQ=100.6), and the Control group scored approximately one full year below norms (IQ=91.5). Significant changes occurred after the kindergarten year: the average IQ of children from the Control pool who had the Englemann program in kindergarten increased significantly to slightly above age level (IQ=104.9), while Control children who went to regular kindergarten remained below age level (IQ=91.5). The average IQ of children who had been in the Enrichment program decreased at the end of regular kindergarten; the IQ levels attained by children who had been in the Englemann pre-school program were maintained at about one year above age level in both the regular and the Englemann kindergartens. (From Erickson, E. L. et al. "Experiments in in Head Start and Early Education: Curriculum Structures and Teacher Attitudes." Final Report to Division of Research and Evaluation, Project Head Start, Office of Economic Opportunity, OEO Contract No. 4150, November 1969, pp. 73-74.

**Dr. Carl Bereiter, now at the Ontario Institute for Studies in Education, originally collaborated with Englemann in designing this program.

2/ Final Report, OEO Contract No. 4150, Nov. 1969, p. 61.

expectation of success not usually found in children completing their first year of school." 3/

b. The Becker-Englemann Follow Through program currently has data over time on nine sites where economically poor children have been enrolled since 1968. Program efforts continue to be directed at groups predicted to do poorly and to fall further behind in school each year--groups with the highest drop-out and lowest achievement rates: southern urban blacks, Indians, Chicanos, and economically deprived whites in isolated rural areas. Results to date contradict this prediction.

Many groups of these deprived children produced mean test scores in the spring of 1970 placing them well above grade after instruction. Tables illustrating program effects follow.* The test administered was the reading portion of the Wide Range Achievement Test (WRAT). The grade level achieved has been computed from the test scores, i.e., items correct according to standardized national norms.

Only two of the available tables from nine different sites have been presented here, but these are representative of the impressive gains produced by the program. In summary, the WRAT reading data, from the 414 poor children who entered the program in first

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3/ "Model Programs-Behavior Principles Structural Model of a Follow Through Program," Dayton, Ohio, Superintendent of Documents Catalog No. HE 5.220:20155, p. 10 (one of 34 booklets prepared by the American Institutes for Research under contract with the Office of Education for The White House Conference on Children, December 1970).

*For purposes of this paper, data on poor children only has been presented. Data on over 1,000 children is presently available. Data on over 4,000 children, including 1,000 third year children, is currently being compiled.

Table 1: Grand Rapids

/End of first grade for children who entered in kindergarten/

	Year	Av. Program Days Complete	WRAT Score	Grade Rating	
N35*	68-69	100.5	21.0	K.9	
	69-70	88.6	37.5	2.0	1.1 = Grade Gain 69-70
N11*	68-69	172.4	33.5	1.7	
	69-70	118.6	58.2	4.1	2.4 = Grade Gain 69-70

Average increase for all 46 Ss = 1.1 grades

Table 2: East St. Louis**

/End of second grade for children who entered program in first grade/

	Year	Av. Program Days Complete	WRAT Score	Grade Rating	
N24*	68-69	130.1	28.7	1.4	
	69-70	157.0	43.0	2.3	.9 = Grade Gain 69-70
N38*	68-69	177.6	50.1	2.9	
	69-70	166.6	62.1	4.7	1.8 = Grade Gain 69-70

Average grade increase for all Ss is 1.4 grades

*Each group has been separated for statistical purposes to show the relationship between days taught and gains achieved.

**In East St. Louis (a severely depressed inner-city black ghetto area), an additional 71 children took the WRAT test but for whom the data on number of days taught was not available. Together, these children had a mean reading grade of 2.8 at the end of first grade the previous year and last spring, achieved a mean grade rating of 4.8, a gain of 2.0 years from spring '69 to spring '70.

grade,* reveals that at the end of the first grade they had a mean grade rating of 2.0 years, and at the end of the second grade the children had a mean grade rating of 3.5 years, indicating a mean increase of 1.5 years during the second grade.

For the 79 poor children who entered the program in kindergarten,** the data indicate that at the end of kindergarten they had a mean grade rating of 1.2 years and at the end of first grade they had a mean grade rating of 2.4, representing a gain of 1.2 years from the previous year.

3. Another behavioral model in Project Follow Through, The Behavior Analysis Approach, is directed by Dr. Don Bushell, Jr., of the University of Kansas.*** In seeking to break the relationship between low income status and actuarial predictions of school failure, the approach relies upon individualized instruction, programmed materials, an enlarged teaching staff, and frequent positive reinforcement through a token economy.****

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*East St. Louis, Mo. (black, ghetto area), N=27; Smithville, Tenn. (rural, appalachia), N=26; East Los Vegas, New Mexico (rural, farming), N=77; Uvalde, Texas (small, rural town of migrant Chicanos), N=50; Tupelo, Miss. (racially mixed small town), N=52; Rosebud Sioux Indian Tribe in a Community Action Program, N=27; Todd County, South Dakota (Sioux Indian), N=49.

**Grand Rapids, Michigan (urban, black), N=46; West Iron County, northern Michigan (white, rural mining country), N=33.

***The program was instituted with 740 children entering public schools in 1968. In the fall of 1971 it was used with over 6,000 poor children in 15 urban and rural districts across the country.

****In that the approach recognizes that a goal behavior must be maintained by "natural" reinforcers, tokens are seen as the extra support needed for learning new skills which when mastered no longer require such extrinsic support.

Chart II

METROPOLITAN READINESS TEST

SPRING POSTTEST SCORES

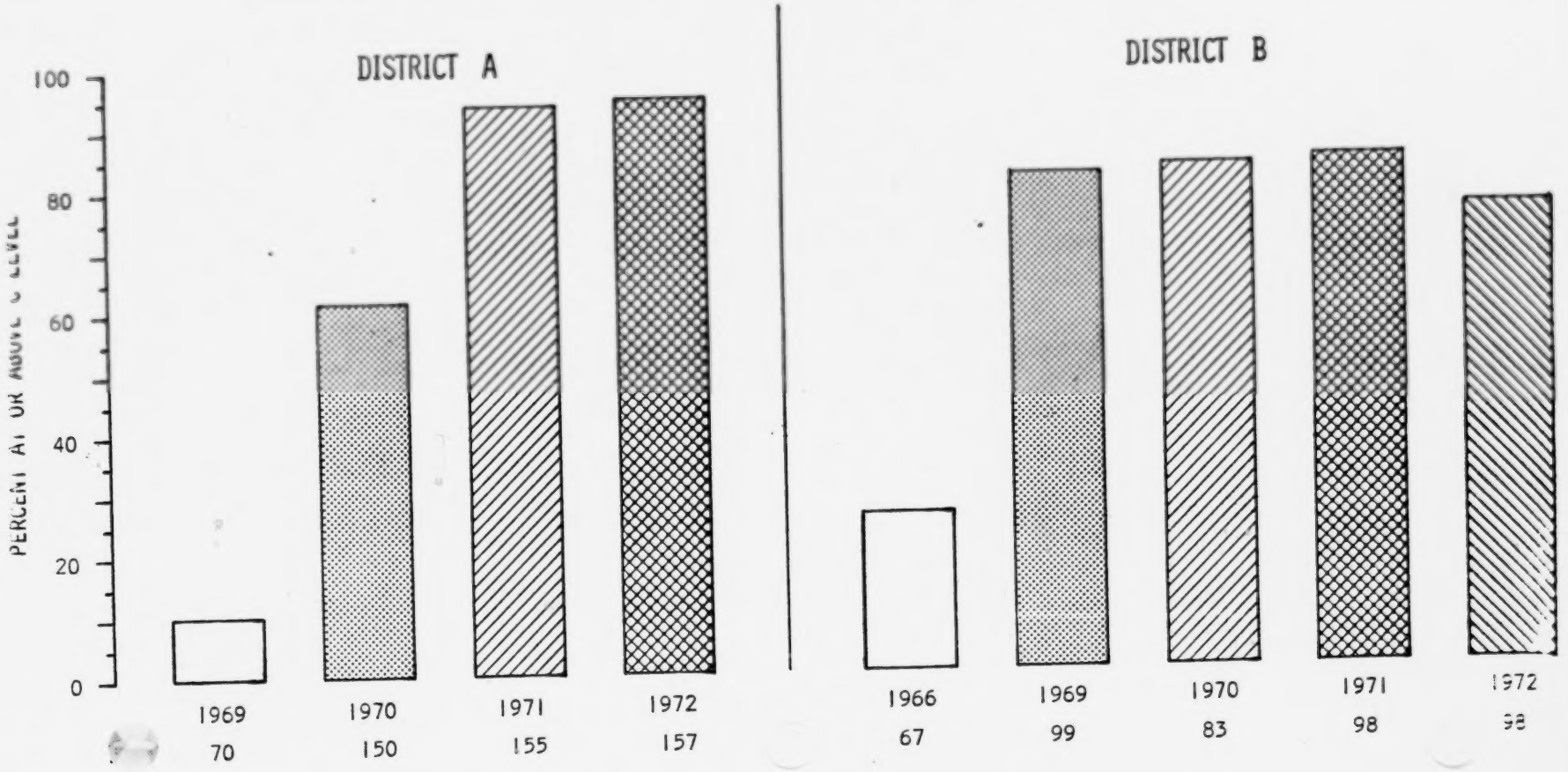
PRE BEHAVIOR ANALYSIS FOLLOW THROUGH

FIRST YEAR **BEHAVIOR ANALYSIS** FOLLOW THROUGH

SECOND YEAR **BEHAVIOR ANALYSIS** FOLLOW THROUGH

THIRD YEAR **BEHAVIOR ANALYSIS** FOLLOW THROUGH

FOURTH YEAR **BEHAVIOR ANALYSIS** FOLLOW THROUGH



The following data are viewed by Bushell as representative of the improvements achieved to date in the reality of operating schools:

a. The Juniper Gardens Parent Cooperative Nursery, located in a severe poverty area of Kansas City, conducts a Head Start project staffed exclusively by the children's parents. Initially, these parents, most of whom are on welfare, were coercive and negative in their relationships with their children at the school. With training in positive tutorial skills and classroom management, they became effective teachers. In the spring of 1970, three sub-tests of the Wide Range Achievement Test (WRAT) were administered to Co-op children and to children matched for pre-test scores, age, family size and income and attending a traditional Head Start program. Chart I on the next page, shows that the Behavior Analysis Co-op children exceeded the control group 4 1/4 months in reading, 1 year and 3 months in spelling, and 5 months in math.

b. Two communities (one rural and one urban) compared the results of the Metropolitan Reading Readiness Test taken by kindergarteners in years prior to and then after the introduction of the Behavior Analysis Approach. Chart II, on page 25, shows the percent of children scoring at or above the test norm before and after the introduction of Follow Through.

In District A, about 10% of the children "passed" the test in 1969. In the Follow Through year, just over 60% passed. In the third and fourth years of Follow Through, 94% and 95% respectively passed. In District B, the comparable figures are a little more than 25% and near or over 80% in subsequent years. In this community (Portageville, Missouri), 44% of the

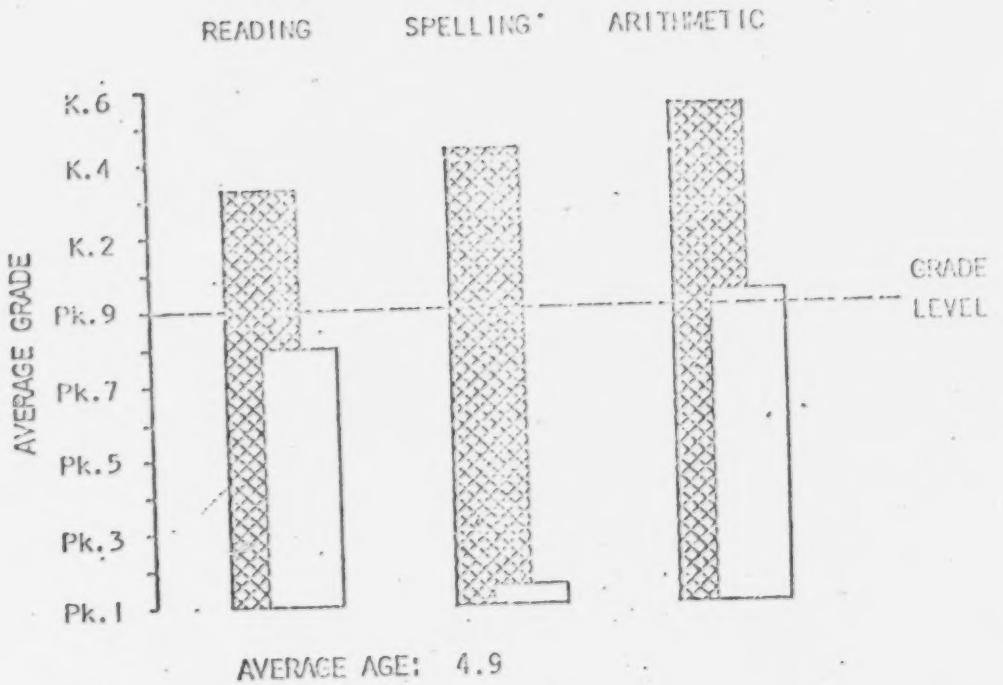
Chart I

WIDE RANGE ACHIEVEMENT TEST

END OF PRE-K AVERAGE SCORE - SPRING 1970

16 BEHAVIOR ANLAYSIS (CO-OP) CHILDREN

MATCHED HEAD START CHILDREN



AVERAGE AGE: 4.9

children taking the test in 1966 were assigned to "special education" classrooms on the basis of the test. In 1969, as a result of the effectiveness of the Behavior Analysis Approach, these classrooms were eliminated.

c. In Trenton, New Jersey, the Wide Range Achievement Test (WRAT) was administered in 1969 and 1970 to kindergarteners and first graders in the Behavior Analysis Program and to their peers receiving traditional instruction in another inner city Title I school. Results in Chart III on the next page, show the Behavior Analysis children exceeded grade level norms each year (indicated by dashes) while children in regular classes not only fell further behind the Follow Through children each year but consistently failed to achieve grade level. The chart also illustrates that it is only at the end of first grade that the comparison group achieved levels attained by the Behavior Analysis Group at the end of kindergarten, i.e., it took them <u>two</u> years to attain what the Follow Through children achieved in one year on this particular achievement battery.*

In view of the academic gains achieved through the Behavior Analysis Program,** the Waukegan Unit School District is considering extending the program beyond its present experimental phase and adapting it on a large scale for its own needs. Bushell has consequently devised the

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*Additional data suggest that parent involvement may be contributing to community stability: thirty-one of the original 39 Behavior Analysis children were in the same school at the end of the second year while in the regular classrooms, only 17 of the original 32 remained.

**Spring, 1971 Metropolitan Readiness Test scores at the Carmen School which had lagged behind other Waukegan schools before the Behavior Analysis Program was instituted, show kindergarteners and first graders above the national norm.

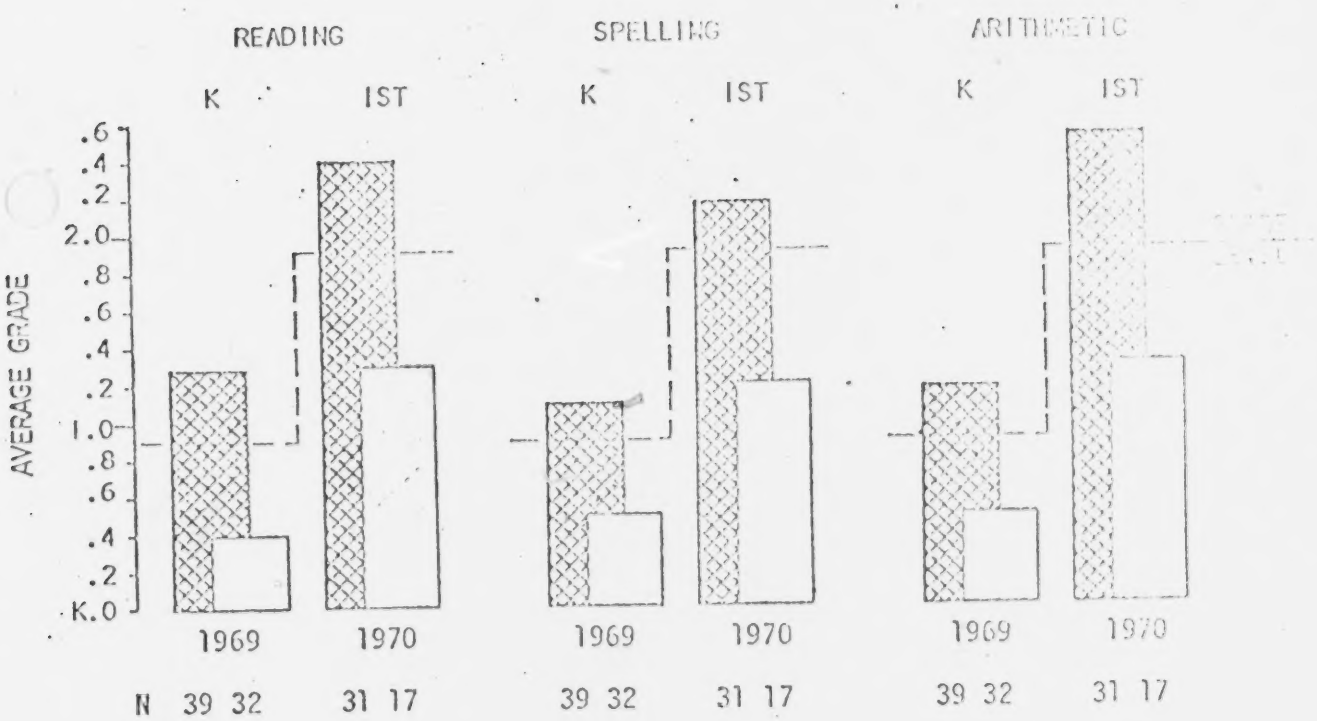
Chart III

WIDE RANGE ACHIEVEMENT TEST

SPRING POST TEST SCORES 1969 AND 1970

FOLLOW THROUGH ▨

NON-FOLLOW THROUGH □



Waukegan Plan which retains the essential ingredients of the Behavior Analysis Program--a teaching staff enlarged by trained parents and aides, individualized instruction, and the student reinforcement system--but which adds monetary bonuses for every staff member on the basis of successful student performance.*

The Plan, however, cuts in half the cost of the present Follow Through program. (Present costs for all Follow Through models vary with location but, the average additional cost per pupil in excess of each district's per pupil cost is $685, including required supplementary services.) The three-year implementation design for staff development and training for grades K-6 estimates the first year operating costs in excess of the basic Waukegan per pupil expenditure at a maximum of $350 per pupil in a 30 pupil classroom, including the full cost of staff incentives. This cost should come down to $262 per pupil after the third year. This maintenance cost represents per pupil expenditures as follows: $163 for an enlarged staff, $10 for supplies, $10 for data analysis and $79 for staff bonuses. The cost will be correspondingly less if any of the services or materials required in the Plan are part of the present school budget--and if the Plan achieves less than 100% success. The estimates

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*A "successful" child is one who advances at least one full year academically according to standardized tests. For each successful child, the school principal would receive $5; the staff trainer, $20; the teacher $25; and the aides and parent teachers, $15 each. Moreover, a teacher whose entire class was "successful" would receive an additional $5 per student. The chief consultant to this project will receive no salary. His only income will be a $30 dividend for each "successful" child during the first year, and slightly less in the remaining years of the implementation period after which his services will be terminated.

assume 180 or more children to be served the first year and 420 or more children to be served the second and subsequent years.

4. Similar data are not available for large groups of older children, although programs are being instituted on an ever-increasing scale at the secondary school level. An idea of what may be accomplished with this age group may be seen in examining the results to date of an experimental project by the Institute for Behavioral Research (IBR) in Silver Spring, Maryland, under a grant from NIMH.

"Programming Interpersonal Curricula for Adolescents" (PICA) is a four-year research and development project to design a part-time educational program for adolescents who are viewed by their schools as pre-delinquent or disturbed. In the first three years of the project, IBR (a) developed program instructional materials to promote interpersonal skills; (b) developed self-instructional materials and a seminar to repair academic deficiencies; (c) established a reinforcement system to maintain appropriate behavior in the learning sessions; (d) developed a 40 unit program of teacher training in classroom behavior modification, self-instructional situations, and instructional materials development, and (e) developed a training course for parents of PICA students.

In the course of the program development, twenty-four junior high school students from the District of Columbia, Prince Georges and Montgomery Counties have been referred to PICA because of disruptive in-school behavior, minimal in-school academic performance, and delinquency. These students have received instruction in math, English

and interpersonal skills for 2 hours a day at the Institute and returned to their respective schools for other subjects. The major emphasis this past year (PICA Year 3) has been on evaluating and refining PICA programs and procedures to permit the transfer of PICA directly into the schools for groups of highly disruptive, failing students for Year 4.

On the basis of a class of 30 students, the per-pupil, per year cost of the package (in excess of a school's basic per pupil expenditure) is given below.

Estimated Cost of the PICA Package

Counselor Time In addition to consulting to the entire program the counselor is to conduct the daily Interpersonal Skills class and will supervise the Parent Program.	$ 15 per student
Three Full-Time Aides -One aide will operate both in the Skills Center and the Reinforcement Area. -One aide will perform clerical and record-keeping duties. -One aide will assist in the Parent Program.	$430 per student
Materials (in addition to standard materials supplied by the school)	$ 15 per student
Media, including film	$ 12 per student
Reinforcers (including furnishings and large items such as a juke box for the Reinforcement Area)	$ 80 per student
Total	$552 per student

(For a group of 30 students, the estimated cost to the school is $16,560.)

The results achieved through PICA are very encouraging. As the following data for the first group of twelve students (PICA Year 2, 1969-70) show, academic increases were dramatic as were improvements in attendance and social behavior.

	PICA Students	Basis for Comparison
Attendance	81% for PICA Year	64% attendance for PICA students in previous year. 75% attendance for normal students in three junior high schools from which PICA students came.
Suspensions	1 student suspended twice.	79 serious infractions by this group, the previous year resulting in 10 suspensions.
Academic Performance		
Failures	3 students received 2 or more failing grades	11 of 12 students received 2 or more failing grades in previous year.
English	A-average for all PICA students	F average for PICA students in pre-PICA year.
Math	A for all PICA students	D average for PICA students in pre-PICA year.
Mean reading ability*	1.6 grade increase in 9 months.	0.8 increase per year before
Mean mathematics*	1.8 grade increase in 9 months	0.7 increase per year before entering PICA.
Mean language ability*	0.6 grade increase in 9 months.	Similar increases previously

*Standardized tests used were the Gates-MacGinitie and the Stanford Achievement Tests. Note that the rate of increase in language ability did not exceed that of the previous year. Curriculum changes to correct this problem are currently under evaluation.

Follow-up on these students during the current year indicates:

- Only two juvenile charges have been placed against these students compared to 17 charges before the PICA year.
- Eight of the twelve are in school. (All were considered potential drop-outs by the referring schools.)
- Of the eight students in school
  - . six are maintaining passing grades in most subjects
  - . one has unverified grades (out-of-state school)
  - . one is failing 4 of 7 courses
- Of four students not in school
  - . one is preparing for the high school equivalency examination
  - . one has applied to enroll in a vocational school
  - . two are full drop-outs
- Parents of all twelve students report good relationships with their children.

C. Replicability

Important indicators of the replicability of the behavior analysis approach are the benefit and cost data cited above, but some further data on costs and other factors related to replication should be considered.

A major consideration is the ease with which teachers can be trained, since teachers are the critical agent in behavior analysis

program success. There is evidence that teachers can be quickly taught to run behaviorally oriented classrooms at relatively small training cost,* although evidence of the effectiveness of such teachers in terms of student outcomes is not available for all programs.

1. The "Planned Variation Interim Report" of the Head Start program for the 1969-70 school year is primarily concerned with the degree and manner in which models of various approaches to early childhood education can be implemented. The eight approaches under evaluation were grouped into three categories: Pre-academic, i.e., behavioral models**(2 models, 6 classrooms); Cognitive-Discovery models (4 models, 12 classrooms); and Discovery models (2 models, 6 classrooms).

In evaluation by Stanford Research Institute observers, a clear relationship between approach and success of implementation emerges. On a scale measuring implementation success, which was largely influenced by success in teacher adaptation, these observers rated one behavioral model first and the other tied for second among the eight models considered.

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*The basic arrangement of one expert teaching others (who may in turn teach others still) is at the heart of many of the training programs being developed throughout the country. Roger Ulrich's "pyramid education" structure, Hugh McKenzie's "consultant teacher," Charles Madsen's expandable "hierarchial" teacher training model and Vance Hall's "Responsive Teaching" model are but four of the best known examples. Ogden Lindsley at the University of Kansas, Robert Hamblin of the Central Midwestern Regional Laboratory and three behaviorally-based Follow Through programs have also developed in-service teacher-training programs that are either being prepared for dissemination or are being disseminated to some extent already. These and other models worthy of HEW attention are described in Appendix D, "Centers of Activity."

**The Becker-Englemann Head Start program and Don Bushell's Behavior Analysis program.

Since all approaches stress teacher training, the quantity of training was also compared directly. SRI devised an assessment and rating procedure to compute training level. The two behavioral programs ranked first and second. This evidence suggests that the clarity and precision with which the Pre-academic models defined program-related teaching skills and efficiently taught them, contributed to their high implementation rankings.

In short, the behavioral sponsors had defined the parameters of their models, had devised evidently effective training procedures and were able to replicate their models more quickly and thoroughly than did the other sponsors.

2. The ease with which teachers can be trained in the behavior analysis approach can also be seen in a study of 13 volunteer teachers from north Florida who received eight hours of training which included lectures on the use of behavioral principles, group discussion, role playing, and guidance in applying principles in a classroom setting. Analysis of pre- and post-observations revealed a significant increase in teacher approval, a decrease in their disapproval and a decrease in inappropriate reinforcement (errors of reinforcement). A follow-up check six months later revealed a slight <u>further</u> increase in positive change for a total of 29% improvement. <u>4</u>/

<u>4</u>/ Madsen, C.H., Jr., and Madsen, D.K., "Teachers as Students: Teacher Training Workshops in Behavior Modification," presentation at the second annual Kansas Symposium on Behavior Analysis in Education, University of Kansas, May 1971.

Another training program 5/ involved fifteen special classroom teachers from an urban county (Project I) and elementary school teachers from two schools in a rural county (Project II). Two weeks of training resulted in substantial positive teacher behavior with corresponding low rates of inappropriate student behavior. Table IV below illustrates these effects:

Table IV

	Project I N=15 (GR 1)	Project II N=28 (K-6)	Comparison Group* N=32 (K-6)
Teacher approval	41%	17%	7%
Teacher disapproval	4%	3%	18%
Teacher errors or approval and disapproval	1%	1%	5%
Positive ratio**	89%	84%	23%
Inappropriate student behavior	18%	24%	59%
Number of observations (average 88% reliability)	492	1,408	1,042

*Comparison Teachers were matched for level of instruction and years of experience.

**The positive ratio is computed by dividing approval by the sum of approval, disapproval and errors.

3. Several programs cited above entail costs in excess of a school's basic per pupil expenditure for reasons detailed in each description and which are project specific. However, other models for introducing behavioral procedures in the classroom involve virtually no extra cost to the school district. These are essentially training programs and entail no other component.

5/ Madsen, D.H., Jr., Madsen, C.K., Saudargas, R.A., Hammond, W.R., Smith, J.B., Edgar, E.E., "Classroom RAID (Rules, Approval, Ignore, Disapproval): A Cooperative Approach for Professionals and Volunteers," Journal of School Psychology, 1970, Vol. 8, No. 3, pp. 180-185.

A major example is R. Vance Hall's "Responsive Teaching Model" at the Juniper Gardens Project in Kansas City. In the last three years, Hall has offered a rigorous graduate course for teachers in behavior modification, consisting of instruction in the basic principles, in techniques of observation and data collection, and in practical applications in the classroom. The cost to the teacher has been $45 for the 3 credit semester course. Hall reports that all 400 teachers who have completed the course have achieved success in promoting productive social and academic behavior with individual students and in some cases in entire classrooms. There has been no additional cost to the school district, for projects are carried out by using reinforcers available in the classroom environment. No tangible reinforcers or additional equipment are brought in.

Hall has emphasized training teachers in skills that will enable them to be more effective in the present school system. His plan now is to expand the Responsive Training Model through four levels of sophistication. This decision has been prompted both by the success of his present program and by the demand for training that this success has generated. Hall calls the basic level of training, Level I. Level II would prepare Level I graduates to teach new teachers, to assist them in carrying out their studies, and to make presentations on behavior analysis to entire school staffs. Level III is a Master's program to prepare individuals with sufficient competencies in behavior modification to enable them to serve in the schools as special classroom consultants. Level IV represents preparation of Ph.D.'s who are proficient in

designing courses in behavior analysis, in training people to carry out research, in servicing a school district and in making presentations to school boards.

Although the Responsive Teaching Model has not yet been fully implemented at all four levels, several of Hall's M.A. and Ph.D. graduates have been hired by school districts as, e.g., school psychologists, counselors, or supervising teachers. Hall reports a "snowballing" effect of an increasing demand by teachers and administrators for training and for the services of his graduates.

It is beyond the scope of this paper to make firm predictions about the costs and other possible obstacles to instituting behavioral programs in the schools. Actual costs and estimates range from an estimated annual $1200-1500 per child at the Learning Village, to an additional per pupil cost of $300-350 in two Follow Through programs,* to the minimal costs for teacher training described for Madsen and for Hall. This paper addresses the need for further cost data and analysis in several of its recommendations in Section VI.

D. Limitations of the Behavioral Approach

While behavior analysis as applied to teaching and classroom management has demonstrated its effectiveness, it is essential to recognize the limitations of the approach. These limitations are due in large part to the fact that the techniques of applied behavior analysis have been developed only recently. (Behavioral procedures were first used

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*This cost is separated out from the total Follow Through budget of an average of $685 per child above basic maintenance, a figure which includes all supplementary services provided through Project Follow Through.

grades. With a few exceptions, as originally designed, the program did not achieve its goals; only after considerable redesigning was the program effective.*

Often problems can be corrected by changing reinforcers; changing program design; or changing the timing of the reinforcers. Probably, inappropriate application of behavior principles often accounts for reported failures.**

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*An analysis revealed that in the original program, the lecture technique used by the teacher required only that the students attend and behave. No responses in the form of quizzes or homework were required and there were thus few responses made by the students which a teacher could reinforce. When teachers were taught the value of daily quizzes to shape learning responses and these quizzes became part of the program (along with payment for improvement) the level of achievement by these gifted underachievers did, in fact, increase.

**R. Vance Hall is currently compiling a summary of studies that did not achieve their goals, complete with an analysis of each case to pinpoint the probable cause of failure. Such a monograph should go far in assisting researchers in avoiding the mistakes of others.

in special education classrooms only in the early 1960's[6/], and in "normal" elementary school classrooms just in 1966.[7/]

By no means have all of the applications enjoyed the success of the programs described above in Sections B and C. The study, "How to Make A Token System Fail," [8/] is perhaps the best known examination of some problems encountered in introducing behavioral techniques in the classroom, but there are others. An illustration of the problems that sometimes occur is a recent unsuccessful attempt to improve the grades of underachieving students at an all black ghetto high school. These students had attained good IQ ratings and scored well on achievement tests, but consistently earned low grades. Consequently, they were offered money contingent on improved classroom work and report card

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6/ a) Bijou, S.W., Birnbrauer, J.S., Kidder, J.D., and Tague, C., "Programmed Instructions as an approach to teaching reading, writing, and arithmetic to retarded children," The Psychological Record, 1966, 16, 505-522. (This published report describes work accomplished in 1961-1963.)

b) Zimmerman, E.H., and Zimmerman, J., "The alteration of behavior in a special classroom situation," Journal of the Experimental Analysis of Behavior, 1962, 5, 59-60.

7/ a) Hall, R.V., Lund, D., and Jackson, D., "Effects of teacher attention on study behavior," Journal of Applied Behavior Analysis, 1, #1, 1968, p. 1-12. (First published report of work done (1966) in a regular public school.)

b) Becker, Wesley C. and Phillips, David, "Systematic Applications of Behavioral Principles in Primary Institutions," USOE Title III project at the Prairie Elementary School, Urbana, Illinois, 1966.

8/ Kuypers, D.S., Becker, W.C., and O'Leary, K.D., "How to Make a Token System Fail," Exceptional Children, 1968, 35, pp. 101-109.

grades. With a few exceptions, as originally designed, the program did not achieve its goals; only after considerable redesigning was the program effective.*

Often problems can be corrected by changing reinforcers; changing program design; or changing the timing of the reinforcers. Probably, inappropriate application of behavior principles often accounts for reported failures.**

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*An analysis revealed that in the original program, the lecture technique used by the teacher required only that the students attend and behave. No responses in the form of quizzes or homework were required and there were thus few responses made by the students which a teacher could reinforce. When teachers were taught the value of daily quizzes to shape learning responses and these quizzes became part of the program (along with payment for improvement) the level of achievement by these gifted underachievers did, in fact, increase.

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V. CONTROVERSIAL ISSUES IN APPLIED BEHAVIOR ANALYSIS

Despite the far-ranging success of behavior modification (and to some extent because of it), several important criticisms have been raised by educators and psychologists.

One is the concern that children will become suspicious of honest, human emotion if they find that signs of social approval are being systematically used as incentives to shape their behavior. A second issue is the danger that a teacher might use the techniques to get children to act in his or her interest rather than their own (i.e., children can be trained to be submissive and orderly in all circumstances). Finally, the precise definition of behaviors that are to be rewarded could exclude important kinds of creativity and divergent behavior on the part of students. Each of these issues is considered below.

The first issue concerning the use of human emotions is most often raised by humanistic psychologists whose major focus is on emotional honesty and consistency in human relations. They believe that the affective characteristics that most often facilitate learning and growth include personal acceptance, trust, caring, and understanding. They express concern that if signs of affection and approval are made contingent on performance in a systematic or formal way, people may perceive that it is their behavior that is valued rather than their personhood. The latter may be experienced as loving, the former as manipulative.

Behavior psychologists, on the other hand, can point to hundreds of case studies which demonstrate that honestly expressed emotion actually served to cripple the recipient because it was delivered at the wrong time or under the wrong circumstances: retardates who did not learn to walk

because of the pity they evoked from their audience by crawling; malingerers who maintained a reluctance to work or study when their teachers made honest attempts to help them; exhibitionists and disrupters who thrived on the honestly displayed anger of their group.

All approaches to education seem to recognize an inherent conflict between total "honesty" and a degree of self-consciousness and self-control on the part of the teacher. Even in the most "free classroom" approach, the teacher restrains himself from giving the student answers, prescribing approaches to problems, or perhaps using abusive language even though he may sometimes feel inclined to such reactions. The behavior analysis approach, however, is more explicit about the self-control required of the teacher.

There is no easy resolution of the inherent conflict between honesty or spontaneous love and a need for self-control. Parents and school officials must simply decide what balance they wish to strike in their school.*

The second issue cites the danger of exploitation, in that incentive systems may be arranged to encourage behavior which is not in the long-run beneficial to the student. This charge can also be leveled at traditional classroom procedures, but the behavior analysis approach allows a teacher to be more explicit in the direction he wishes

* The arguement that there is no inherent conflict between humanism and behaviorism but that an understanding of behavioral principles may permit man greater opportunities for freedom is presented in the March/April 1971 issue of The Humanist magazine. This Special Symposium issue on "Psychology and Humanism" includes the following articles: "Behaviorism is Humanism" by Kenneth MacCorquadale; "Humanistic Psychology and Contemporary Behaviorism" by Willard F. Day; "Freudianism, Behaviorism, and Humanism" by Robert Brinckerhoff; "Reason with Compassion" by H. Y. Eysenek. (Eysenek is Chief editor of Behavior Research and Therapy - and a Board member of th British Humanist Association.)

to take and to be more confident of his effect on the student. This ability to set explicit objectives, however, permits public accountability of teachers where the less explicit objectives of traditional classrooms make public accountability difficult. The managers of behavorial systems should be required to make public the exact forms of behavior they are promoting and the procedures used to promote behavior change. In addition, they should be required to justify these behavioral goals in terms of the presumed long-term benefits for the students. This makes the system open to public evaluation and responsive to pressure for change. Sound behavior analysis projects have no difficulty providing this information; they provide it automatically.

Thus, in a behavior analysis program if a teacher is found to be using an incentive system only to keep students quiet and orderly, the community served by that teacher can decide whether or not that objective is what it wants to promote.

The final issue is the danger of shaping a kind of passive acceptance of authority, in that incentive systems, and step-by-step programs of instruction may be arranged to shape a narrowly defined repertoire of "correct" responses* and coincidentally to make opportunities to

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* The Head Start, Planned Variation has introduced a measure for analyzing learning responses: The Hertzig-Birch scoring of the Stanford-Binet Intelligence Scale. While norms for the test have not yet been established and findings in the Planned Variation Interim Report are quite tentative, it was found that children in Pre-academic, i.e., behavioral classes, score higher than those in other types of classrooms on indices of passivity (making no response to test questions). The interpretation that children in behavioral programs may have learned to respond only when they knew the answer is confounded by the large number of Hopi Indian children in the Pre-academic sample. (Hopi children are reputedly more passive than many other ethnic groups.) Subsequent replications will provide normative data, with possibly important implications for the further development of behavioral programs.

question or challenge the system occur infrequently. Obviously, such a use of any system would run counter to a very important goal of education, namely to teach people intelligently to question, inquire, criticize, and eventually to take control of their own education and their own government.* There is, however, no inherent incompatibility between behavior analysis and free inquiry. In fact, knowledge of the principles and techniques of behavior modification should enable a teacher to increase the frequency of such questioning. A model of classroom management can readily be designed around a mix of precisely pinpointed, teacher-student contracted, sequenced instruction along with opportunities for free-wheeling inquiry. The problem is not so much with the methods of behavior analysis as with the danger that they will be inappropriately applied. This danger must constantly be avoided as new behavior analysis programs are created.

* At present, too little is known about how to achieve this goal, although an important line of research deals with ways of involving students in the construction of their own incentive systems. Until more is learned, however, a reasonable overall evaluation index would be the frequency with which critical questions and spontaneous inquiry arise and are met with honest support and mutual search for answers. Free schools, such as the British Infant School tend to have a high score on this index. The traditional American classroom does not. (See Resnick, Lauren B., "Teacher Behavior in an Informal British Infant School," a paper presented before the American Educational Research Association, February 1971, New York. Also Johns, J., "The relationship between teacher behaviors and the incidence of thought provoking questions by students in secondary schools," Journal of Educational Research, 62, 17-22, 1968).

VI. RECOMMENDATIONS

Existing evidence on the effectiveness of the behavior analysis approach indicates that parents and State and local officials should be aware of the approach as one important alternative for operating their schools. They should be given the information necessary to decide whether they wish to adopt the approach and those who choose to adopt the approach should be assisted to do so effectively. Moreover, current evidence indicates a substantial need for additional research on the approach. Thus, the following possible steps are submitted for consideration by the Office of Education, with participation of other HEW agencies.

It is recommended that the Office of Education conduct an analysis to determine whether these or other steps should be taken and, if so, to develop a plan to carry them out.

While the paper does not present evidence on the value of non-classroom application of the behavior analysis approach and thus makes no recommendations in that area, it would be desirable for such applications to be examined. NIMH might take the lead in such an examination.*

A. Classroom Applications

The Work Group recommends that the Office of Education analyze the use of behavior analysis techniques in both special and regular

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* Many such applications exist. For instance -

-- changes in the design of shopping centers so as to utilize them more effectively as sources of incentives for education and work-related activities for young people, rather than having them serve as focal points for anti-social behavior; and

-- new ways to get patients to come regularly to a community health clinic for needed check-ups or to follow recommended medical procedures in the home.

classrooms. The following feasibility and desirability of actions should be examined:

1. A Comprehensive Evaluation of Behavior Analysis Programs in the Classroom. A coordinated, in-depth evaluation of representative behavior analysis programs in the classroom would seek to ascertain, for example, the impact and costs of various models, the amount of technical assistance needed, and the degree to which results may be generalized, i.e., what program components seem essential for success.

   Prior to the launching of such an evaluation effort, or as the first phase of the evaluation itself, should come the development of (a) techniques for training observers and (b) a standardized measurement system.

   a. Observer Training Program. The best tool that exists for measuring the kinds of behavior change sought by behavior analysis programs is through teams of observers trained in the mechanics and routines of observing, counting and quantifying behavior. Standardized training procedures should be developed which can be incorporated into an exportable observer training package.

   b. Standardized Measurement System. Techniques of observation and measurement have been developed and widely used in behavioral programs across the

country over the last several years. One of the most common measures of participation and disruptive behavior, for example, is the interval observation (usually of ten-second units) which makes use of a time-ruled check list. This technique is sensitive to rate, amplitude and duration of a given behavior and quickly picks up the effects of a classroom procedure.* Standardization of measures and procedures for observation and analysis should take place before behavior modification programs may be compared against each other. A standardized approach would also obviate the need for each practitioner to develop his own system--a costly procedure.** Standard tools could, of course, be used for non-behavior analysis programs as well.

2. The Establishment of Comprehensive Demonstration Sites.

A number of behavior analysis demonstration sites, developing various different models might be created to exhibit the best practices in behavior analysis in schools. Each site would be not only a demonstration model, but

* In regard to participation, for example, researchers at the University of Kansas have developed a PLA-CHECK, a time-sample observation of planned activities. Observations examine how well a teacher's plans are being implemented. It shows maximum, minimum and average participation and reveals strengths as well as weaknesses of curricula and management that the teacher and consultant can focus on and correct.

** Todd Risley, of the University of Kansas, contracted in 1971 with the Carnegie-Mellon Institute. A report on his work will appear in the "Journal for Applied Behavior Analysis" in 1973.

also a center for training and further research as well. Each site should include:

a. Facilities for the design, testing and demonstration of new organizational patterns aimed at providing incentives to all participants in the educational process (researchers, administrators, teachers, parents, and children) to work together in attaining precise educational goals. Several administrative innovations are currently being tested, e.g., rescheduling gym, club periods and other activities to use access to them as incentives for other work; organizing for peer tutoring, and education pyramiding; making the necessary provisions for instructing "special education" children in regular classrooms; training principals for the role of administrative "behavioral-engineers." But to date such innovations are being approached piece-meal. An important goal of the demonstration site should be the development of comprehensive, new organizational schemes involving all participants.* Such organizational schemes should involve coordination across a wide range of educational levels, from pre-school and early childhood programs to high school and college

* Norris Haring of the University of Washington at Seattle has done relevant work in this regard. His in-service teacher training design stresses training all or most teachers in a given school so that they will understand and assist each other's efforts and includes training of the principal so that he may support his teachers, interpret their efforts to parents and the school-board--and rate his teachers precisely in terms of performance.

level programs in psychology and education. An important line of research should be the design of curriculum and scheduling around mixes of structured and free activities to analyze and combine the best ingredients of both.

b. A coordinated program for training teachers and researchers emphasizing training in performance-based competencies.* A formal affiliation with a college or university seems necessary for implementing the training of personnel connected with the demonstration site. Such training programs ought to take full advantage of "pyramiding" in which the university would train Ph.Ds who would instruct graduates and undergraduates who would do their practicum work in the demonstration school while training parents or aides who might also teach in the school. Preferably, training would emanate from the university's School of Education (rather than the Department of Psychology) both because the School of Education could provide the university student with courses necessary for

* For an up-to-date treatment of this subject, see Burdin, J.L., and Reagan, M.T. (Eds.), Performance-based Certification of School Personnel, Washington, D.C: Association of Teacher Educators, 1971. Note that if pending legislation passes, the State of Washington will be the first State to establish performance-based criteria for certification equal in weight to the more traditional criteria.

State licensing and because it could probably best serve as a model for other colleges of education.

c. A basic research capacity. The university with which the demonstration site is associated for staff training purposes, should also have the resources for basic research in the behaviorial sciences. A flexible structure should permit an easy transfer of research findings into the demonstration school itself.

d. Ongoing work in developing curricula designed to permit individualization and to promote self-management.

e. Implementation and refinement of schemes to keep track of individual progress such as the self-charting procedures advocated by the proponents of "Precision Teaching."*

f. The continuing examination of the efficacy and suitability of specific reinforcers and the contingencies of reinforcement.

g. Arrangements for visitor services and a technical assistance staff to advise interested administrators in applying the demonstration model to their own classrooms and systems.

These suggested demonstration sites would not operate in isolation but would participate in a consortium of demonstration sites to pool information and share ideas and findings.

* Notably O. R. Lindsley, Norris Haring, Eric Haughton

It is essential that public relations and information dissemination experts, in the National Center for Educational Communication, for example, keep this project before the public if the sites are to adequately fulfill their demonstration function.*

This suggestion might be implemented through the Experimental Schools program, through Title III of the Elementary and Secondary Education Act, or through several other possible funding sources in USOE.

3. An Evaluation of Major Pre-Service and In-Service Teacher Training Programs. Training in behavior analysis has made a considerable difference in hundreds of classrooms already. The Department should explore the feasibility of stimulating development of exemplary in-service and pre-service programs to train teachers in behavior analysis techniques. The Work Group has already identified several teacher training programs in behavior analysis.**

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* The Work Group has identified a number of centers of activity with the capacity to undertake demonstration projects. These are reported in Appendix D.

** Pre-service programs include those at the University of Vermont, the University of Kansas, the University of Utah, Southern Illinois University, the University of Washington (Seattle) and the University of Oregon (Eugene). In-service programs are more wide-spread. In addition to those offered by the institutions mentioned above, in-service programs are available through Florida State University, O.R. Lindsley's Behavior Research Corporation, the Institute for Behavioral Research, the PittsburghLearning Research and Development Corporation, Western Michigan University, the Central Mid-Western Regional Laboratory and the Community Mental Health Center at Huntsville. Training programs are undoubtedly offered by other institutions mentioned in Appendix D and at institutions both public and private that were not identified by the Work Group.

On the basis of the promising results obtained in changing teacher behavior and improving student performance in several projects examined in this preliminary survey, it is recommended that an evaluation/action endeavor be considered by USOE to:

a. Define desired teacher behaviors.

b. Identify the universe of pre-service and in-service teacher training programs in behavior analysis with a view toward evaluating (1) their proven effectiveness in improving teacher behavior; (2) their effectiveness in improving student behavior (social and academic); and (3) their replicability.

c. Develop a plan of action whereby HEW may advertise and export exemplary programs complete with technical assistance possibly contracted from the designers of these programs. This plan might well include the expansion of pre- and in-service training models already receiving some support from the Department such as those financed through Titles III and VI of the Elementary and Secondary Education Act, or through certain Educational Laboratories, the Bureau of the Educationally Handicapped, and the Bureau of Educational Personnel Development.

4. <u>The Facilitation of the Exchange of Management-System Adaptations that Local Groups have Made to Commercial Instructional Materials.</u> Economic constraints often prevent teachers from rapidly acquiring programmed

curriculum materials (such as "Individually Prescribed Instruction," disseminated by Research for Better Schools of Philadelphia) which are easily employed in individualized incentive systems. Instead, they take apart the existing materials provided by their school districts in order to "pinpoint" indicators of progress upon which incentives can be based. Their solutions frequently include the construction of special tests or work samples, use of particular record-keeping procedures, development of peer-tutoring techniques or special roles for classroom aides, and the development of methods for administering incentives to individuals or groups. Hundreds of teachers and consultants around the country are currently engaged in this process of adaptation and many of their solutions may be imaginative and effective.

Descriptions of such adaptations could be fed into a readily accessible clearing house so that teachers and school administrators interested in the economical adaptation of behavior management techniques could (1) learn who has already adapted standard commercial materials for use in behaviorally engineered classrooms and (2) obtain the tests, remedial materials and management procedures that have been developed. It is recommended that USOE consider having the Practice Improvement Division of the National Center for Educational Communications--

a. Document the need for exchange of information and materials and, if appropriate -

b. Collect information that would form the data base for dissemination;

c. Consider available mechanisms for dissemination such as ERIC, the present Educational Materials Clearinghouse, Regional Labs and centers, the fairly large number of flourishing, special-interest communications networks, e.g., Ogden Lindsley's private, computer-based system, and existing State or regional communication sytems;

d. See that the available mechanisms are used to disseminate the information.

In addition, the Office of Education could also investigate whether the publishers of widely used instructional materials might be willing to adapt their products for use in classrooms employing behavior management techniques.

5. The Design and Dissemination of Information for School Administrators.

In the last few years, there has been a proliferation of behavior analysis literature for parents, teachers, and university students. The need now is for a manual for school administrators. The Work Group therefore recommends that USOE consider supporting the development of such a handbook designed to answer such practical questions as start-up and maintenance costs; teacher training models; actual classroom models which best serve specific needs, e.g. for the retarded, the disadvantaged, the emotionally disturbed; funding sources; and the availability of area consultant services to introduce a model and provide training and guidance along the way.

The evaluation handbook would serve to promote quality, scientifically sound and sophisticated programs rather than ones that could conceivably run aground due to lack of technical know-how or a simplistic view of how to achieve educational improvement, i.e. the kinds of problems already discussed above in the sections on Limitations and Controversial Issues. The National Center for Educational Communication might also develop a plan for other forms of direct communication to administrators.

6. Promotion of Awareness of Behavior Analysis Programs in Discretionary Funding Sources in USOE. Several USOE programs permit discretionary funding of projects on the basis of innovative character or particular promise of success. The Work Group recommends that USOE managers of such programs as ESEA Title III, the Dropout Prevention Program, and the Bi-lingual Education Program become familiar with the behavior analysis approach. While these programs should continue to consider other innovative and promising approaches, familiarity with the behavior analysis approach will assure that behavior analysis projects get full consideration for funding.

B. Research Suggestions

The Work Group recommends that USOE consider funding substantial research and development in behavior analysis. Several ideas for basic and applied research have been mentioned under the section on Limitations and Controversial Issues and in the recommendation for a demonstration network. Other fertile areas for research include the following:

1. Longitudinal Analysis. It is not known what ultimate academic, social and emotional effects would result from long-term exposure to a school environment where operant procedures are employed. These answers might

be sought through an in-depth, longitudinal study of students in a school like the Learning Village, or preferably, of students in a much larger enterprise such as that which would result from the creation of model sites or systems.

2. Follow-up Evaluation. A related need is the systematic analysis of the effects of removing children from a behavior analysis program after a period of time. Research might be carried out to ascertain the degree to which these students maintain achievement and otherwise cope with classrooms where praise and rewards occur intermittently at best. This problem, of course, relates to the behavioral principle of extinction whereby behaviors that do not receive some form of reinforcement eventually disappear.

3. Secondary Effects. A behavior analysis program may have effects other than those it is designed to achieve. Possible unanticipated effects should be examined in both the longitudinal and follow-up studies. Studies might examine, for instance, the impact a precise, step-by-step behavior analysis program to teach reading has on imaginative inquiry, creativity, and initiative.

4. Maintenance of Acquired Behaviors. As long-range effects of current techniques are identified through follow-up evaluation, research should be conducted on ways to improve the duration of effects, i.e., on ways to maintain a new behavior once reinforcement becomes infrequent and irregular. Among other possibilities, this research would explore procedures for promoting self-reinforcement and self-motivation.*

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* cf. Resnick, B. Lauren, "Applying Applied Reinforcement," (Unpublished manuscript, 1971)

5. Interrelationships of Target Behaviors. Research is needed on the interrelationships between various behaviors which may be reinforced. A recent study at the Central Midwestern Regional Laboratory,[9/] for example, found that reinforcing study behavior alone did not result in increased academic output or accuracy. When correct academic work was reinforced, disruptive behavior actually increased. Only when reinforcement was contingent on both deportment and correct work did both behaviors increase significiantly.* This study suggests the need for carefully arranging contingencies for all target behaviors and the need to further examine the phenomenon of "generality," i.e., the extent to which changed behavior in one setting spreads to other settings or even transfers to other behaviors.

6. Teacher Behavior. Another relevant area for research is teacher training. The whole area of teacher behavior has emerged as a vital research field. Behavioral psychologists and educators have been deeply involved in analyzing classroom interactions to define desirable teaching skills and in translating their findings into the design of precise and effective training strategies. Many of their projects have focused on training teachers to create a positive classroom environment, model

9/ Ferritor, D., Buckholdt, D., Hamblin, R., and Smith, L., "Effects of Contingent Reinforcement for Attending Behavior on Work Accomplished," (unpublished manuscript, June 1971).

* This is a vital research field and findings to date are frequently conflicting. In a study by Dr. Joseph Cobb of the Oregon Research Institute, for example, (Cobb, Joseph A., "The Relationship Between Discrete Classroom Behaviors to Fourth Grade Academic Achievement," Oregon Research Institute, Bulletin, Vol. 10, No 10, Nov., 1970) a high correlation between various appropriate classroom behaviors and academic achievement was noted.

desirable behavior, reduce disruption without threats or coercion, and accelerate student learning through positive reinforcement of incremental steps. While the work to date has been valuable in defining performance-based criteria, it is recognized as only a beginning. Many proponents of these criteria effectively argue that more research is needed to determine what teacher behaviors bring about specific student outcomes. Research planners should assess the work done in this field, and promote further research in relating teacher behaviors to student outcomes in all domains.

7. Adaptation of Existing Behavior Modification Materials for Public Education (possibly televised) in Self-Management and Family Problem-Solving. There is an enormous need to update the intutitve understanding, by parents in particular, and the public in general, of the basic dynamics of reward and punishment and to provide them with techniques of distinguishing the long-term from the short-term effects of their action on other people.

The case-history literature is now filled with examples in which the most well-intentioned actions of parents dealing with their children, children dealing with their aging parents, and marriage partners dealing with one another (to name just a few classic situations) have been shown to maintain the very behavior individuals were trying to change. Knowledge of some simple principles and techniques of behavior modification would help people to free themselves from such self-defeating situations. (Although the literature on self-management per se is smaller, a substantial number of case histories can be found in which people have helped themselves to work more regularly, eat less, overcome fear of public speaking, and so forth, through application of these same basic techniques.)

A research effort would be useful to identify situations in which general knowledge of behavior analysis concepts could be applied by individuals to the solution of their family and personal problems. Research is also needed to find effective ways to teach behavior analysis concepts to the general public. One possible means for such public education would be a television program.*

8. Domain-Referenced Testing. Standardized, norm-referenced tests are difficult (some people say impossible) to use in connection with systematic incentive systems, essentially because the domain from which the items on the test are "sampled" is usually not clearly defined. Without a clear definition of the domain there is always the danger that instruction will be reduced to "teaching the test." Some serious problems in the conceptualization of the relationship between general, evaluative testing and the "behavioral definition" of concrete educational objectives remain to be solved before the situation becomes entirely comfortable. It is very important to support basic research and theoretical work in this area in order to prevent promising ventures in incentives, accountability and performance-contracting from being sidetracted by controversy about what exactly is being taught and how it should be tested.**

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* The National Center for Educational Research and Development recently funded a proposal by the Upper Midwest Regional Educational Laboratory (UMREL) to develop a "Televised Parent Training Program: Reinforcement Strategies for Mothers of Disadvantaged Children" which while limited in scope may become one model for reaching a larger public.

** cf Glaser, R. and Nitko, A., "Measurement in Learning and Instruction" and Cronbach, L., "Test Validation," in Thorndike, R., (Ed.) Educational Measurement, American Council on Education, 1971.

9. The Social Psychology of Small Groups. Reinforcement theorists are beginning to discover (to some extent rediscover) that applying incentive systems to groups rather than to individuals has some powerful effects.* Forming students into teams, for example, and making access to desired activities contingent upon the academic performance of the "lowest" member of the team has been found to facilitate the learning of virtually all the team members to a greater extent than basing access to the activity upon each individual performance separately. Research dealing with the effect of such group incentive systems, not only on task performance but also on the development of interpersonal skills, represents an area of study which has in the past been outside the main stream of behavior modification work. It is important to bring it in.

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* cf Hamblin, Robert L., Hathaway, Craig, and Wodarski, Jan, "Group Contingencies, Peer Tutoring and Accelerating Achievement," paper presented before the second Annual Kansas Symposium on Behavior Analysis in Education, May 1971

APPENDIX A

BASIC LITERATURE IN THE ANALYSIS OF BEHAVIOR

Appendix A

Basic Literature in the Analysis of Behavior

The Classics

Ferster, C. G., and Skinner, B. F. Schedules of Reinforcement. New York: Appleton-Century-Crofts, 1957.

Skinner, B. F. The Behavior of Organisms, an Experimental Analysis. New York: Appleton-Century-Crofts, 1938.

Skinner, B. F. Science and Human Behavior, New York: MacMillan, 1953.

Skinner, B. F. Verbal Behavior. New York: Appleton-Century-Crofts, 1957.

Skinner, B. F. Cumulative Record. New York: Appleton-Century-Crofts, 1961.

Other Basic Sources

Catania, C. A. (Ed.) Contemporary Research in Operant Behavior. Glenview, Illinois: Scott, Foresman Company, 1966.

Honig, W. K. Operant Behavior, Areas of Research and Application. New York: Appleton-Century-Crofts, 1966.

Sidman, M. Tactics of Scientific Research. New York: Basic Books, 1960.

Skinner, B. F. Contingencies of Reinforcement: A Theoretical Analysis. New York: Appleton-Century-Crofts, 1969.

Verhave, Thom (Ed.) The Experimental Analysis of Behavior, Selected Readings. New York: Appleton-Century-Crofts, 1966.

Readable Introductory Texts

Ferster, C. B. and Perrott, March C. Behavior Principles. New York: Appleton-Century-Crofts, 1968.

Reese, Ellen P. The Analysis of Human Operant Behavior. Wm. C. Brown Co., 1966.

Laboratory Manuals

Michael, Jack. Laboratory Studies in Operant Behavior. New York: McGraw-Hill Book Company, Inc., 1963.

Reese, Ellen P. Experiments in Operant Behavior. New York: Appleton-Century-Crofts, 1964.

Articles Touching on Social Philosophical Issues Associated with the Analysis of Behavior

Campbell, Donald T. "Reforms as Experiments," American Psychologist, 24, 4, April 1969.

Goldiamond, I. "Justified and Unjustified Alarm over Behavioral Control." In O. Milton (Ed.) Behavior disorders: perspectives and trends. Philadelphia: Lippincott, 1965.

The Humanist Magazine. Special Symposium Issue, "Psychology and Humanism" March/April, 1971.

Krasner, L. "The Behavioral Scientist and Social Responsibility: No Place to Hide," Journal of Social Issues, 1965, 21 (2), 9-30.

Miller, George A., "Psychology as a Means of Promoting Human Welfare," American Psychologist, 24, 12, Dec. 1969.

Psychology: A Behavioral Reinterpretation, Proceedings of the American Philosophical Society. Philadelphia, 1964, Volume 108, No. 6.

Skinner, B. F. "Freedom and the Control of Men," American Scholar 24, 47-65. (reprinted in Cumulative Record.)

Skinner, B. F. "The Design of Cultures," Daedalus. Summer, 1961, 534-546. (reprinted in Cumulative Record.)

Relevant Journals

Journal for the Experimental Analysis of Behavior

Behavior Research and Therapy

The Journal of Applied Behavior Analysis

The SALT Journal (School applications of Learning Theory)

Journal of Child Psychology and Psychiatry

The Journal of School Psychology

Exceptional Children

Educational Technology

Behavior Therapy

The Journal of Behavior Therapy and Experimental Psychology

Some Recent Conferences on Applied Behavior Analyis

1969 University of Hawaii Conference on Behavior Modification. (published proceedings)

1969 Conference on "The Nature of Reinforcement," sponsored by the Learning Research and Development Center, University of Pittsburgh. (Proceedings in press)

1971 University of Oregon Symposium on "Uses of Reinforcement Principles in Education" for the National Science Foundation held inWashington, D. C.

1971 Second Annual Symposium on Behavior Analysis in Education, hosted by the University of Kansas as a component of Project Follow Through (Proceedings in press)

1971 Fourth annual Alabama state-wide Conference on Behavior Analysis

Reports from the field are also presented at meetings of the Association for the Advancement of Behavior Therapy, at area and national conferences of the American Psychological Association, and are included in other conferences such as those sponsored by the American Educational Research Assocation.

APPENDIX B

APPLICATIONS OF THE BEHAVIOR ANALYSIS APPROACH

APPENDIX B

Applications of the Behavior Analysis Approach

This appendix has been designed to provide an overview of major applications of the behavior analysis approach and has been organized into the following sections:

1) Mental Illness, Retardation, and Special Education
2) Learning Disabilities and Compensatory Education
3) Physical Disabilities
4) Delinquency
5) Normal Education

   a) Preschool and Elementary School Applications
   b) Secondary School and College Applications

Each section includes:

-- A brief summary of the "state of the art" for the area.
-- A list of representative reports of research and development.
-- A list of individuals at representative institutions where research, development, and training programs are currently going on.

It has been impossible, in the time given to this position paper, to put together definitive reviews of the above areas. The items included are simply intended to give the critical reader an idea of the degree of activity in the area, the kind of research and development work being done, and the kinds of concrete products now available or soon to be expected.

Much important work has undoubtedly been overlooked, and sincere apologies are due to those whose work has been omitted. However, we hope that those following up suggested next phases of Federal action stemming from this report, will be led to a more comprehensive review of the field through contacts with the people and institutions listed.

(Note that in the lists: each entry includes the name of a person who can be contacted for information about the program, the name of the institution and a brief note suggesting the thrust of the program. Further, since research and research training are part of virtually every program, these emphases have been omitted from all the notes.)

A truly excellent source book covering almost the entire range of behavior modification is: Ulrich, R., Stachnik, T., and Mabry, J. Control of Human Behavior. (two volumes, 1966 and 1970) Glenview, Illinois: Scott, Foresman and Co.

The quality of the selections reprinted in these volumes is extraordinary; anyone seriously reviewing the field should begin with them.

1. Mental Illness, Retardation, and Special Education.

This is a very large and active field, well represented by several general source books:

Ayllon, T. and Azrin, N., The Token Economy: A Motivational System for Therapy and Rehabilitation. New York: Appleton-Century-Crofts, 1968.

Bandura, A. Principles of Behavior Modification. New York: Holt, Rinehart & Winston, 1969.

Bijou, S.W. and D. M. Baer (Eds.). Child Development: Readings in Experimental Analysis. New York: Appleton-Century-Crofts, 1967.

Hamblin, Robert. The Humanization Process. New York: Wiley, in press.

Krasner, L. and Ullmann, L. (Eds.). Research in Behavior Modification, New Developments and Implications. Chicago: Holt, Rinehart, and Winston, 1965.

Ullmann, L. and Krasner, L. (Eds.) Case Studies in Behavior Modification. Chicago: Holt, Rinehart, and Winston, 1966.

Ullmann, L. and Krasner, L. A Psychological Approach to Abnormal Behavior, Prentice-Hall, 1969.

Quay, H. C. & Werry, J. S. (Eds.). Behavior Disorders of Children. New York: Wiley, in press.

The general "state of the art" in rehabilitation of adult mental patients is not (at least to this reviewer) as clear as it is in the case of work with children, although the work of Ayllon and Azrin stands as a landmark for the field. The work with children is distinguished by its direct attack on specific behavior problems and avoidance of general diagnostic categories. This is yielding very effective and easily-described procedures for eliminating forms of behavior which are disruptive, bizarre, or otherwise incompatible with skill development. It is also yielding behaviorally-based diagnostic procedures and programs of instruction aimed at supplying specific behavioral skills missing in the repertoires of retarded or disturbed children, e.g. socialized eating, dressing, personal hygiene, basic motor skills, speech, etc. Several of these programs are at the point of being packaged for effective dissemination. Notable examples of packageable

procedures may be found in the programs of Robert Hamblin, David Buckholdt and Dan Ferritor at the Central Midwestern Regional Laboratory, and in Ivar Lovaas' program at UCLA, both concerned with the treatment of autistic children.

A natural outgrowth of such work is the establishment of training programs and consulting services for parents, so that they can supply systemmatic support for the target behavior outside the institutional setting. Sidney Bijou at the University of Illinois has been a pioneer in this approach. Relatively packageable training programs for parents have been developed by several people.

A related trend is toward the development of "early-warning" and special treatment programs, tied into community mental health programs and to the regular educational system, through which parents and teachers, who observe signs of potentially troublesome behavior, can receive consultation to correct the problem before it becomes severe enough to warrant a "clinical" label. Within this framework, severe problems may be handled for a short time in a special treatment center and the child returned as rapidly as possible to the normal home or classroom with support provided by follow-up consultation for the parents and teachers. The provision of sheltered environments or "halfway houses" for severely handicapped youth and adults would be a logical final component of such a program.

Representative reports

Bijou, S. W. and Peterson, R. F. "The psychological assessment of children: a functional analysis," In P. McReynolds (Ed.). Advances in Psychological Assessment, Vol. II. (To be published).

Bijou, S. W., Birnbrauer, J. S., Kidder, J. D., & Tague, C. "Programmed instruction as an approach to teaching of reading, writing, and arithmetic to retarded children." The Psychological Record, 1966, 16, 505-522.

Haring, N. A. and Lovitt, T. C. "Operant Methodology and educational technology in special education", in N. A. Haring and R. L. Schiefulbush (Eds), Methods in Special Education, New York, McGraw-Hill, 1967.

Hawkins, R. P., Peterson, R. F., Schweid, E., & Bijou, S. W. "Behavior therapy in the home: amelioration of problem parent-child relations with the parent in a therapeutic role," Journal of Experimental Child Psychology, 1966, 4, 99-107

Hewett, F. M., Taylor, F. D. & Artuso, A. A. "The Santa Monica project: evaluation of an engineered classroom design with emotionally disturbed children," Exceptional Children, 1969, 35 523-532.

Kale, R. J., Kaye, J. H., Whelan, P. A., & Hopkins, B. L. "The effects of reinforcement on the modification, maintenance, and generalization of social responses of mental patients," Journal of Applied Behavior Analysis, 1968, 1, 303-304.

Lindsley, O. R. "An experiment with parents handling behavior at home," Jonestone Bulletin, 1966, 9, 27-36. (Reprinted in Fargo, G. A. Behrns, C., and Nolan, P. Behavior Modification in the Classroom, Wadsworth, 1970.)

Lovaas, O. I. "Learning theory approach to the treatment of childhood schizophrenia," Behavior Theory and Therapy, California Mental Health Research Symposium No. 2, State of California, Dept. of Mental Hygiene, Bureau of Research, 1968.

O'Brien, F., Azrin, N., & Henson, K. "Increased communication of chronic mental patients by reinforcement and by response priming." Journal of Applied Behavior Analysis, 1969, 2, 23-29.

O'Leary, K. D. "Diagnosis of children's behavior problems," In H. C. Quay and J. S. Werry (Eds.). Behavior Disorders of Children. New York: Wiley, (in press.)

O'Leary, K. D., O'Leary, S. G., & Becker, W. C. "Modification of a deviant sibling interaction pattern in the home," Behavior Research and Therapy, 1967, 5, 113-120.

Panyon, M., Boozer, H., & Morris, N. "Feedback to attendants for applying operant techniques," Journal of Applied Behavior Analysis, 1970, 3, 1-4.

Peterson, R. F., Cox, M. A. & Bijou, S. W. "Training children to work productively in classroom groups," Exceptional Children, in press.

Risley, T. R. "The effects and side effects of punishing the autistic behaviors of a deviant child," Journal of Applied Behavior Analysis, 1968, 1, 21-34.

Schaeffer, H. & Martin, P. Behavioral Therapy, McGraw-Hill, 1969.

Sloane, H. N., Johnston, M. G., & Bijou, S. W. "Successive modification of aggressive behavior and aggressive fantasy play by management of contingencies," Journal of Child Psychology and Psychiatry, 1967, 8, 217-226.

Wahler, R. G. "Setting generality: some specific general effects of child behavior therapy," Journal of Applied Behavior Analysis, 1969, 2, 239-246.

Wahler, R., Winkel, G., Peterson, R., and Morrison, D. "Mothers as behavior therapists for their own children," Behavior Research and Therapy, 1965, 3, 113-124.

Walder, L., "Teaching Parents and Others Principles of Behavioral Control for Modifying the Behavior of their Children." Final Report, Project No. III, Grant No. 32-30-7515-5024, Bureau of Research, Office of Education, December 1968.

Zimmerman, E. H., Zimmerman, J., and Russell, C. D. "Differential effects of token reinforcement on instruction--following behavior in retarded students instructed as a group," Journal of Applied Behavior Analysis, 1969, 3, 101-112.

Representative institutions with ongoing programs

Teodoro Ayllon. Georgia State University, Atlanta. Development of special education programs for public schools.

Nathan Azrin. Anna State Hospital, Anna Illinois. Comprehensive institutional programs for adult mental patients and recent work with children.

Beatrice Barrett. Fernald School, Waverly, Mass. Institutional programs for mentally retarded.

Sidney Bijou. University of Illinois, Urbana. Training programs for retarded and disturbed children. Training of parents and teachers.

Terrance Frommong. University of Puget Sound. Reorganization of special services to assist children with learning disabilities while enabling them to remain in normal classrooms.

Robert Hamblin. Central Midwestern Regional Educational Laboratory, St. Louis, Mo. Training programs for autistic children and children with "learning disabilities." Training programs for parents and teachers.

Robert Hawkins. Kalamazoo Valley School District (Michigan). Special education programs for public schools.

Norris Haring. Children's Rehabilitation Unit, University of Washington, Seattle, Washington. Training programs for retarded and disturbed children. Development of special education programs for public schools.

James Lent. Parsons State Hospital, Parsons, Kansas. Comprehensive institutional programs for the mentally retarded.

O. R. Lindsley. University of Kansas. Training, consultation, technical support for teachers, parents, and institutional staff members.

Ivar Lovaas. University of California, Los Angeles. Comprehensive institutional programs for autistic children.

Charles Madsen. Florida State University. Special education programs for public schools.

K. Daniel O'Leary. University of New York, Stoneybrook. Behavior modification programs in a university laboratory school for problem children.

John Mabry. Porterville State Hospital; Porterville, California. Comprehensive institutional programs for mentally retarded.

Hugh MacKenzie. University of Vermont. Special education programs for public schools.

Gerald Patterson. Oregon Research Institute, Eugene. Home and school consultation and support programs.

Howard Sloane. University of Utah, Salt Lake City. Education programs for public schools.

Beth Sulzer. University of Southern Illinois. Special education programs for public schools.

Travis Thompson. Faribault State Hospital, Faribault, Minnesota. Comprehensive institutional programs for mentally retarded.

Robert Wahler. University of Tennessee. Parent training, home-based modification programs.

2. Learning Disabilities and Compensatory Education.

In behavioral terms, work in this area is a natural extension of the basic approach sketched above in Section 1. Deficits or problem behavior associated with cultural deprivation are attacked directly by defining alternative forms of behavior and setting up intensive programs to cause children to acquire them. Where there are no obvious physiological abnormalities, the behavioral treatment of learning disabilities is indistinguishable from the treatment of mild forms of mental illness or retardation. The same strategies of early detection, compensatory treatment in a context that involves minimal segregation, and systematic return to "normal" education are applicable.

Recent intensive work in this area, stimulated to a large degree by Office of Education programs, has produced a considerable number of exportable basic education programs concentrating mainly on language skills, reading, and arthmetic, together with associated incentive systems and teacher-training programs. Those produced by the CEMREL Learning Disabilities Program, the Becker-Engelmann Follow Through Program, the Behavior Analysis Follow Through model developed by Don Bushell, the Primary Education Program developed for Head Start and Follow Through under the direction of Lauren Resnick, and the reading program developed by Arthur Staats of the University of Hawaii, are especially noteworthy.

Representative Reports

Bereiter, Carl, and Engelmann Siegfried, Teaching Disadvantaged Children in the Preschool, Prentice-Hall, 1966.

Bushell, D. The Behavior Analysis Classroom. Follow Through Project, University of Kansas, Lawrence, Kansas, 1970.

Cantrell, R. P., Cantrell, M.D. Huddleston, C. M. & Wooldrige, R. C. "Contingency contracting with school problems," Journal of Applied Behavior Analysis, 1969, 2, 215-220.

Jacobson, J. M., Bushell, D., and Risley, T. "Switching requirements in a Head Start classroom," Journal of Applied Behavior Analysis, 1969, 2, 43-47.

McKenzie, H., Clark, M., Wolf, M., Kathera, R., and Benson, R. "Behavior modification of children with learning disabilities using grades or tokens and allowances as back-up reinforcers," Exceptional Children, Summer, 1968, 745-752.

Miller, L. K. and Schneider, R. "The use of token system in project Head Start," Journal of Applied Behavior Analysis, 1970, 3, 213-220.

Nolan, P. A., Kunzelman, H., and Haring, N. "Behavior modification in a junior high learning disabilities classroom," Exceptional Children, November 1967, 163-168.

O'Leary, K. D. and Becker, W. C. "Behavior Modification of an Adjustment class: a token reinforcement system," Exceptional Children, 1967, 33, 637-642.

O'Leary, K. D. and Drabman, R. "Token Reinforcement Programs in the Classroom: A Review," Psychological Bulletin, (in press).

Ryback, D. & Staats, A. W. "Parents as behavior therapy technicians in treating reading deficits (dyslexia)," Journal of Behavior Therapy and Experimental Psychiatry, 1970, 1, 109-119.

Staats, A. W., Minke, K. A., Goodwin, W. & Landeen, J. "Cognitive behavior modification: "Motivated Learning" reading treatment with sub-professional therapy technicians," Behavior Research and Therapy 1967, 5, 283-299.

Representative institutions with ongoing programs

Wesley Becker. University of Oregon, Eugene. Behaviorally-based Follow Through Program, specialized curricula, pre-and in-service teacher training.

Don Bushell. University of Kansas, Lawrence. The Behavior Analysis Approach to Project Follow Through Program. Associated staff training package.

David Buckholdt. Central Midwestern Regional Educational Laboratory, St. Louis. Early elementary, compensatory education programs for inner city classrooms. Associated teacher training packages.

R. Vance Hall. University of Kansas. Nursery school through junior high school programs for the culturally deprived.

Lauren Resnick. Learning Research and Development Center, Pittsburgh. Individually prescribed instruction for inner city elementary school children.

Arthur Staats. University of Hawaii. Programs of instruction, incentive systems, parent training materials for children with reading problems.

3. Physical Rehabilitation

Motivation has been characterized by Fordyce as the "modal problem" of rehabilitation. Work in this area is concerned with arranging incentive systems to cause people to persist in exercise, dietary regimens, etc., which although immediately unpleasant or painful are essential for long-run improvement. An important aspect is the separation of physiological influences on performance from psychological influences. For example, the frequency of a patient's complaints of chronic pain may be as much a function of the attention, pity, or release from stressful conditions which they typically produce, as of actual stimulation of pain receptors in the nervous system.

There is considerable current activity in training of physical therapists and researchers in this area, and a great deal of individual casework, but there are at present few motivational systems or treatment plans for specific rehabilitation targets ready for immediate dissemination. On the other hand, the design of behavioral "prosthetic" devices promises to be a very important practical technology yielding widely disseminable and useful products. The portable "self-control" devices developed by Azrin and his associates are good examples. A review of the field by Fordyce will be published in the fall as part of a symposium volume resulting from a recent conference on psychological aspects of rehabilitation, sponsored by Division 22 of the American Psychological Association. (The chairman of the editorial committee is Walter Neff of New York University.) Recent developments in the area of speech therapy are collected in an excellent book by

Sloan, H., and MacAulay, B. (Eds.), Operant Procedures in Remedial Speech and Language Training, Boston, Houghton-Mifflin, 1968. Another useful source is Meyerson, L., Kerr, N., and Michael, J., "Behavior Modification in Rehabilitation," in S. W. Bijou and D. M. Baer (Eds.), Child Development: Readings in experimental analysis. New York: Appleton-Century-Crofts, 1967, pp. 214-239.

A relatively untouched but related area has to do with problems of aging. A parallel problem to that encountered in rehabilitation is the separation of "decline" due to physiological causes from behavioral decline caused by reduction of stimulation and rewards for accustomed activities. Engineering of responsive environments for the aging is an extremely important goal. (C.f. Lindsley, O. R., "Geriatric Behavioral Prosthetics," in R. Kastenbaum (Ed.), New Thoughts on Old Age, New York: Springer, 1964, pp. 41-60.)

Representative Reports

Azrin, N., Jones, R. J., and Flye, B. "A synchronization effect and its application to stuttering by a portable apparatus," Journal of Applied Behavior Analysis, 1968, 1, 283-295.

Azrin, N. and Powell, J. Behavioral Engineering: "The use of response priming to improve prescribed self-medication," Journal of Applied Behavior Analysis, 1969, 2, 39-42.

Fordyce, W. E. "Operant conditioning as a treatment method in management of selected chronic pain problems," Northwest Medicine, Aug. 1970, Vol. 69, 580-1.

Fordyce, W. E., Fowler, R. S., Lehmann, J. F., Delateur, B. J. "Some Implications of Learning in Problems of Chronic Pain," Journal of Chronic Diseases, 1968, Vol. 21, pp. 179-190.

Fowler, R. S., Fordyce, W. E., Berni, R. "Operant Conditioning in Chronic Illness," American Journal of Nursing, Vol. 69, No. 6, June 1969.

Pigott, R. A. "Behavior Modification and Control in Rehabilitation," Journal of Rehabilitation, July-August 1969, Vol. 35, No. 6, pp. 12-15.

Representative Institutions

James Crosson. University of Oregon.

Wilbert E. Fordyce. University of Washington, Seattle.

Laurence Ince. Goldwater Memorial Hospital. New York City.

Jack Michael. Western Michigan University, Kalamazoo.

Lee Myerson. Arizona State University, Tempe.

4. Delinquency

The behavior analysis approach has produced some promising new strategies for rehabilitation of juvenile offenders. If one takes seriously the notion that young people should be rehabilitated rather than punished for their offenses, then intensive educational programs and effective incentive systems must be arranged to provide them with marketable skills, acceptable and rewarding ways to spend leisure time, and social problem-solving strategies to enable them to cope effectively in society. As in the work on mental illness and retardation, the approach takes two main directions: highly structured institutional programs aimed at specific behavioral targets, and programs of parent, school, and community follow-up to help in the transition out of the institution. One of the most promising programs from the viewpoint of practical effectiveness, generalizability, and ease of installation is the "Teaching Family Model" developed by Montrose Wolf and his associates at Kansas, in which professionally-trained foster parents arrange educational programs and incentive systems for small groups of youngsters living as a family, outside the usual institutional context. The programs of Tharp and Wetzel and of Ronald Holschu represent broader applications of the approach to community and youth services.

Representative Reports

Bailey, J. S., Wolf, M., & Philips, E. L., "Home-based reinforcement and the modification of pre-delinquents' classroom behavior," Journal of Applied Behavior Analysis, 1970, 3, 223-233.

Cohen, H. L. "Model: Motivationally oriented designs for an ecology of learning," in H. L. Cohen, I. Goldiamond, J. Filipczak, & R. Pooley (Eds.) Training professionals in procedures for the establishment of educational environments, Silver Spring, Md., Educational Facility Press-IBR, 1968.

Cohen, Shlomo, et. al. "The Anne Arundel County Learning Center Progress Report," Fort George G. Meade, Md., November 1969.

Phillips, E. L. "Achievement Place: token reinforcement procedures in a home-style rehabilitation setting for "pre-delinquent boys," Journal of Applied Behavior Analysis, 1968, 1, 213-223.

Zangwill, Willard I. and Stern, Joyce, D. "The Anne Arundel County Learning Center: An Experiment in Educating Problem Teenagers." Unpublished manuscript, Office of the Secretary (Education Evaluation), Department of Health, Education, and Welfare, November 1970.

Representative institutions with ongoing programs

Harold Cohen. Institute for Behavioral Research, Silver Spring Maryland. Comprehensive training school programs.

Shlomo Cohen. Anne Arundel County Learning Center, Fort George G. Meade, Maryland. Comprehensive training school programs with parent involvement.

Ronald Holschu. Big Brothers of Kansas City. Behaviorally based community youth service.

Gerald Patterson. University of Oregon. Parent training programs.

Todd Risley. University of Kansas, Lawrence. Incentive systems for small training schools.

Howard Sloane. University of Utah. Comprehensive training school programs.

Richard Stuart. University of Michigan. Parent training programs.

Thomas Sturm, Lino Lakes Correction Center, Lino Lakes, Minnesota. Comprehensive training school programs.

Montrose Wolf. University of Kansas, Lawrence. Incentive systems and training programs based in professional foster homes.

5. Normal Education

The general pattern of development in behavior-modification work has been from attacks on relatively narrow targets (often those which presented dramatic problems), in situations where the experimenter had a high degree of authority for explicit control, to more complex targets and less authoritarian contexts. As the basic principles have been shown to be effective in therapy, rehabilitation, and compensatory education, their application to normal education has met with progressively wider acceptance. However, general applications of the approach to normal education, have been discussed vigorously since the fairly distant time when Skinner published his classic article "The Science of Learning and the Art of Teaching" in 1954*. A large part of this discussion has been carried on in connection with the topic of programmed instruction, but the programmed instruction movement proved to be limited in its practical impact upon normal education, partly because until recently there were few attempts to integrate the use of programs into incentive systems and organizational arrangements which took full advantage of them.

Except for the two basic sources included in the list of general references, below, the fields of "programmed instruction" and "individually prescribed instruction" are not reviewed here. But

*Reprinted in Cumulative Record, see Appendix A

the reader should bear in mind that they are verly closely related to the more general field of behavior modification: wherever experimental, behaviorally-based educational programs are developed, detailed step-by-step analysis of sequences of instruction is a natural result.

A recent and representative review of the field may be found in Hanley, E..M., "Review of Research Involving Applied Behavior Analysis in the Classroom," Review of Educational Research, 40, 5, 597-625. The 75th Yearbook of the National Society for Studies in Education (NSSE) under the editorship of Carl Thoresen (Stanford University) will be devoted to the topic of behavior modification in education. Other representative general references include:

Fargo, G. A., Behrns, C., and Nolan, P. Behavior Modification in the Classroom, Belmont, California, Wadsworth Pub. Co., 1970.

Jung, S. M., Lipe, D., & Wolfe, P. S. "Study of the Use of Incentives in Education and the Feasibility of Experiments in School Systems." American Institutes for Research, Palo Alto, California, 1971. (Prepared under contract to the Department of Health, Education, and Welfare.)

Lumsdaine, A. and Glaser, R. (Eds.) Teaching Machines and Programmed Learning (two volumes, 1960 and 1965). National Education Association.

Proceedings: Second Annual Symposium on Behavior Analysis in Education, University of Kansas, May 1971 (in press).

"Progress in Behavior Modification: Programs and Results" (Conference Proceedings). Youth Development Center of the School of Social Work, University of Hawaii. January 1969.

Schutz, R. E. & Baker, R. L. "The experimental analysis of behavior in education research." Psychology in the Schools, 1968, 5, 240-256.

Skinner, B. F. Cumulative Record, New York, Appleton-Century-Crofts, 1961 (Part III).

Skinner, B. F. The Technology of Teaching. New York: Appleton-Century-Crofts, 1968.

Staats, A. W., Child Learning, Intelligence, and Personality. Principles of a Behavioral Interaction Approach. New York: Harper & Row, 1971.

5a.) Preschool and elementary school applications.

This has been the area of most intense recent activity. Its main product has been the development of in-service teacher-training models and consultant services. (Note that several colleges of education have begun to include behaviorists on their teaching faculties.) Literally thousands of teachers and teacher trainees have carried out behavior-modification projects in their classrooms as a result of participation in workshops or university courses. (See Appendix C for a list of materials produced for such courses.) However, with few exceptions (Ulrich's Learning Village, Myerson's Slater Elementary School, Phillips' Prairie School) applications have restricted to individual classrooms within the normal organizational structure. The time is ripe for experimentation with new organizational schemes involving whole schools. As these activities grow in the public schools, the need for behaviorally defined curricula incorporating complex educational goals becomes very pressing. (See Section VI in the main body of this report for recommendations along these lines.)

The list of institutions under this Section is especially arbitrary since a large percentage of workers in other applied fields would undoubtedly like to extend their activities to normal education. Don Bushell, Robert Hamblin, O. R. Lindsley, Todd Risley, Lauren Resnick, and Roger Ulrich are good examples of generalists in the field.

Representative Reports

Barrish, H., Saunders, M., and Wolf, M. "Good behavior game: effects of individual contingencies or group consequences on disruptive behavior in a classroom," Journal of Applied Behavior Analysis, 1969, 2, 119-124.

Bushell, D., et. al. "Applying "group" contingencies to the classroom study behavior of preschool children," Journal of Applied Behavior Analysis, 1968, 1, 55-61.

Etzel, B. C., & Gewirtz, J. L. "Experimental modification of care-taker maintained high-rate operant crying in a 6- and 20-month-old infant (infant tyrannateurus): Extinction of crying with reinforcement of eye contact and smiling," Journal of Experimental Child Psychology, 1967, I, 303-317.

Glynn, E. L. 'Classroom applications of self-determined reinforcement," Journal of Applied Behavior Analysis, 1970, 3, 123-132.

Hall, R. V., Panyon, M., Raban, D., and Broden, M. "Instructing beginning teachers in reinforcement procedures which improve classroom control," Journal of Applied Behavior Analysis, 1968, 1, 315-322.

Hall, R. C., Lund, D. & Jackson, D. "Effects of teacher attention on study behavior," Journal of Applied Behavior Analysis, 1968, 1, 1-12.

Homme, L. E., DeBaca, D. C., Devine, J. V., Steinharst, R., and Rickert, E. J. "Use of Premack principle in controlling the behavior of nursery school children," Journal of the Experimental Analysis of Behavior, 1963, 6, 544.

Lovitt, T. and Curtiss, K., "Academic response rate as a function of teacher and self-imposed contingencies," Journal of Applied Behavior Analysis, 1969, 2, 49-55.

Madsen, C. H., Jr., Becker, W. C., & Thomas, D. R. "Rules, praise, and ignoring: Elements of classroom control," Journal of Applied Behavior Analysis, 1968, 1, 139-150.

Madsen, C. H., and Madsen, D. K. "Teachers as Students: Teacher Training Workshops in Behavior Modification," presentation at the Second Annual Symposium on Behavior Analysis in Education, University of Kansas, May 1971.

Mandelker, A. V., Brigham, T. A., and Bushell, D. "The effects of token procedures on a teacher's social contacts with her students," Journal of Applied Behavior Analysis, 1970, 3, 169-174.

Niedermyer, F. C. Parent-assisted Learning, Inglewood, California Southwest Regional Laboratory for Research and Development, 1970.

O'Leary, K. D., Becker, W. C., Evans, M. B. & Saudargas, R. A. "Token reinforcement program in a public school: A replication and systematic analysis," Journal of Applied Behavior Analysis, 1969, 2, 3-13.

Osborne, J. G. "Free time as a reinforcer in the management of classroom behavior," Journal of Applied Behavior Analysis, 1969 2. 113-118.

Packard, R. G. "The control of "classroom attention:" a group contingency for complex behavior," Journal of Applied Behavior Analysis, 1970, 3, 13-28.

Risley, T. R. & Hart, B. "Developing correspondence between non-verbal and verbal behavior of pre-school children," Journal of Applied Behavior Analysis, 1968, 1, 267-281.

Thomas, D. R., Becker, W. C., & Armstrong, M. "Production and elimination of disruptive classroom behaviors by systematically varying teachers behavior," Journal of Applied Behavior Analysis 1968, 1, 35-45.

Ulrich, R. E., Louisell, S. E. & Wolfe, M. "The Learning Village: a behavioral approach to early education," Educational Technology, in press.

Representative institutions with ongoing programs

Don Bushell. University of Kansas. Teacher Training for Behavior Analysis Follow Through Schools.

Harold Cohen. Institute for Behavioral Research, Silver Spring, Maryland. Teacher training, classroom management procedures at the elementary and junior high school levels.

Marvin Daley. Upper Midwest Regional Educational Laboratory, Minneapolis, Minnesota. Comprehensive Management Systems for Elementary School.

Ann D. Duncan, Yeshiva University. General classroom technology, self-management.

Vance Hall. University of Kansas, Lawrence. Teacher training, classroom management procedures.

Eric Haughton. Precision Teaching Program, Eugene, Oregon. Public schools, general classroom technology, self-management.

Lloyd Homme. Individual Learning Systems Corp., San Raphael, Calif. Motivation systems, self-management.

O. R. Lindsley, University of Kansas. General classroom technology, teacher and student support systems.

Hugh McKenzie, University of Vermont. Programs to train consultant teachers.

Charles Madsen. Florida State University. Teacher training workshops.

Dan Myerson. Slater Elementary School; Mt. View, California Comprehensive K-6 program in a public elementary school.

Edwin Myers. University of Minnesota. Performance-contracting nursery schools.

David Phillips. University of Illinois, Urbana. Comprehensive K-6 program in a public, elementary school. In-service training procedures.

Todd Risley. University of Kansas, Lawrence. Programs for teaching early verbal behavior preschool programs.

Stanley Sapon. University of Rochester, N. Y. Programs for teaching early verbal behavior.

Stanley Seidman. Broward County, Florida. District-wide teacher training at all levels.

Roger Ulrich. Western Michigan Univ., Kalamazoo. Comprehensive private school program, infants through teens.

Scott Wood. Drake University. Training for clinical psychologists to work in schools and other applied settings.

5b.) Secondary School and College Applications

Applications of principles and techniques of behavior modification to college courses have come about mainly through psychologists' attempts to practice what they teach. The format for the resulting course typically involves some form of contract between instructors and students specifying the knowledge or skill to be acquired, individual or small-group assignments for which mastery tests are devised, and enlistment of considerable student help in teaching and testing one another. Similar courses are beginning to be designed for high schools, but few systems are yet available in "packaged" or readily generalizable form. The well designed text by Ferster and Perrot (Behavior Principles, Appleton-Century-Crofts) and the elaborate system developed by Richard Mallott of Western Michigan University are representative of the state of the art.

Applications of operant techniques in high schools have been rare, but a coupling of the college course formats with basic incentive systems and procedures of self-government such as those pioneered by Wolf (Section 4 above) offers exciting possibilities.

Representative Reports

Keller, F. S. "Goodbye, teacher--,"Journal of Appled Behavior Analysis, 1968, 1, 79-89.

Krumboltz, D. & Thoresen, C., Behavioral Counseling: Cases and Techniques. Holt, Rinehart & Winston, 1969.

Lloyd, K. E. and Knutzen, N. J., "A self-paced programmed undergraduate course in the experimental analysis of behavior," Journal of Applied Behavior Analysis, 1969, 2, 125-134.

Mallott, Richard W. and Svinicki, John G. "Contingency Management in an introductory psychology course for one thousand students," Psychological Record, 1969, 19, 545-556.

McAllister, L. W., Stachowaik, J. G., Baer, D. M., & Conderman, L. "The application of operant conditioning techniques in a secondary classroom," Journal of Applied Behavior Analysis, 1969, 2, 277-285.

MacDonald, W. S., Gallomore, R., & MacDonald, G., "Contingency counseling by school personnel: An economic model of intervention," Journal of Applied Behavior Analysis, 1970, 3, 175-182.

MacMichael, J. and Carey, J., "Contingency management in an introductory psychology course produces better learning," Journal of Applied Behavior Analysis, 1969, 2, 79-84.

Myers, W. A. "Operant learning principles applied to teaching introductory psychology course produces better learning," Journal of Applied Behavior Analysis, 1970, 3, 191-197.

Osipow, S. & Walgh, W. Strategies in Counseling for Behavior Change. Appleton-Century-Crofts, 1970.

Representative Institutions with Ongoing Programs

David Born. University of Utah, Salt Lake City. Behaviorally-based college and high school courses.

Charles Ferster. American University, Washington, D.C. Behaviorally-based college courses.

Gerald Mertens. St. Cloud State College, St. Cloud, Minn. Behaviorally-based college courses.

R. Vance Hall. University of Kansas. Teacher Training and consultation.

Richard Malott. Western Michigan University, Kalamazoo. Behaviorally-based college courses.

Jack Michael. Western Michigan University, Kalamazoo. Behaviorally-based college courses.

Everett Murdock. University of Utah, Salt Lake City. Self-control and study skills programs for college and high-school students.

Marion Thompson. Atlanta Public Schools. Behavior modification instruction and teacher training included at middle school level.

Donald Widders. Bridgewater College, Bridgewater, West Virginia. Behaviorally-based college courses.

Scott Wood. Drake University. Behaviorally-based college courses.

Appendix C

Selected Materials Available for Instructing Parents and Teachers in Behavior Analysis Techniques

Appendix C

Selected Materials for Instructing Parents and Teachers in Behavior Analysis Techniques

The books listed here are suitable for diverse populations, and range from simplified parent "handbooks" to college-level texts. Several are programmed.

1. Bateman, Barbara. Learning Disorders. Seattle, Washington: Special Child Publications, 1971.

2. Becker, W. C. Parents are Teachers. Champaign, Illinois: Research Press, 1971.

3. Becker, W. C., Thomas, D. C. Carnine, D. Reducing Behavior Problems: An Operant Guide for Teachers. Urbana, Illinois: ERIC Clearinghouse on Early Childhood Education, 1969.

4. Becker, W. C. Teaching Children. The Engelmann-Becker Corp. Eugene, Oregon, 1969.

5. Becker, W. C., Engelmann, S. and Thomas, D. C. Teaching: A Course in Applied Psychology. Palo Alto: Science Research Associates, 1971.

6. Benson, Arthur M. (ed). Modifying Deviant Social Behaviors in Various Classroom Settings. Eugene, Oregon: Department of Special Education, College of Education, University of Oregon, 1969.

7. Bereiter, C. and Engelmann, S. Teaching Disadvantaged Children in the Preschool. Prentice-Hall, 1966.

8. Bijou, S. W. and Baer, D. M. (Eds.) Child Development: Readings in Experimental Analysis. New York: Appleton-Century-Crofts, 1967.

9. Blackham, G. and Silberman, A. Modification of Child Behavior: Principles and Procedures. Belmont, California: Wadsworth Publishing, 1970.

10. Buckley, Nancy K. and Walker, Hill M. Modifying Classroom Behavior: A Manual of Procedure for Classroom Teachers. Champaign, Illinois: Research Press, 1971.

11. Bradfield, R. H. (Ed.) Behavior Modification: The Human Effort. San Rafael, California: Dimensions Publishing Co., 1970.

12. Champagne, D. W. and Goldman, R. Teaching Parents Teaching. New York: Appleton-Century-Crofts, 1971 (in press).

13. Deibert, Alvin N. and Harmon, Alice J. New Tools for Changing Behavior. Champaign, Illinois: Research Press, 1971.

14. Fargo, G., Behrns, C., and Nolan, P. Behavior Modification in the Classroom. Belmont, California: Wadsworth Publishing Co., 1970.

15. Fielding, Leonard T. The Modification of Human Behavior. Oakdale Medical Center, Suite 309, Minneapolis, Minnesota, 1970.

16. Glaser, E. M. and Sarason, I. G. "Reinforcing Productive Classroom Behavior" (A Teachers Guide to Behavior Modification). PREP #18 (Putting Research into Educational Practice). National Center for Educational Communication, Office of Education, DHEW, 1971.

17. Guerney, B. F., Jr. (Ed.) Psychotherapeutic Agents: New Roles for Non-professionals, Parents, and Teachers. New York: Holt, Rinehart and Winston, Inc., 1969.

18. Hall, R. Vance. Managing Behavior, Parts I, II and III. Merriam, Kansas: H & H Enterprise, Inc., 1970.

19. Hamblin, Robert L. Buckholdt, David, Ferritor, Daniel, Kozloff, Martin and Blackwell, Lois. The Humanization Process, John Wiley, in press. (Audio-Visual training materials also in preparation by this group)

20. Homme, L., Csanyi, A., Gonzales, M., Rechs, J. How to Use Contingency Contracting in the Classroom. Champaign, Illinois: Research Press, 1969.

21. Hunter, Madeline. Reinforcement, Theory into Practice. El Segundo, California: TIP publications, 1967.

22. Johnson, Lois V. and Bany, Mary A. Classroom Management. New York: MacMillian, 1970.

23. Kunzelmann, Harold P. (Ed.) Precision Teaching: An Initial Training Sequence. Seattle, Washington: Special Child Publications, Inc., 1970.

24. Madsen, Charles H. and Madsen, Clifford K. Teaching/Discipline: Behavioral Principles Toward a Positive Approach. Boston: Allyn & Bacon, 1970.

25. Malott, R. Adventures of Con Man (Contingency Management) in Education and Other Equally Exciting Places. (comic book format) Kalamazoo, Michigan: Behaviordelia, 1971.

26. Meacham, Merle L. and Wiesen, Allen E. Changing Classroom Behavior: A Manual for Precision Teaching. Scranton, Pennsylvania: International Textbook Co., 1969.

27. McIntire, Roger W. For Love of Children: Behavioral Psychology for Parents. Del Mar, California: CRM Books, Inc. 1970.

28. Neiseworth, John T., et. al. Student Motivation and Classroom Management. Behavior Technics, Inc., 1969.

29. O'Leary, K. D. and O'Leary, S. Classroom Management: The Successful Use of Behavior Modification. New York: Pergaman Press. Fall, 1971, in press.

30. Pitts, Carl. Introduction to Educational Psychology. Thomas Crowell, 1971.

31. Patterson, Gerald R. and Guillon, M. Elizabeth. Living With Children. Champaign, Illinois: Research Press, 1968.

32. Rubadeau, D. O. and Hertzman, A. D. (Eds.) Behavior Modification Techniques for the Classroom. Ginn-Blausdell, in press.

33. Seidman, Stanley B. Classroom Contingency Management. Broward County Diagnostic Center, Fort Lauderdale, Florida, 1970.

34. Skinner, B. F. The Technology of Teaching. New York: Appleton-Century-Crofts, 1968.

35. Sulzer, B. and Mayer, G. R. Behavior Modification Procedures for School Personnel. Chicago: Dryden Press, 1971, in press.

36. Tharp, Roland and Wetzl, Ralph. Behavior Modification in the Natural Environment. Academic Press, 1969.

37. Ullmann, Leonard and Krasner, Leonard. (Eds.). Case Studies in Behavior Modification. New York: Holt, Rinehart and Winston, Inc., 1965.

38. Ulrich, Roger, Stachnik, Thomas and Mabry, John. Control of Human Behavior, Vols. I and II. Glenview, Illinois: Scott, Foresman and Company, 1966 and 1970.

39. Valett, Robert E. Modifying Children's Behavior. Pacemaker Books, Fearon Publishers, 1969.

40. Webster, S. W. Discipline in the Classroom. San Francisco: Chandler Publishing, 1968.

41. Whaley, Donald L. and Malott, Richard W. Elementary Principles of Behavior. New York: Appleton-Century-Crofts, 1971.

42. Woody, R. H. Behavioral Problem Children in the Schools: Recognition, Diagnosis, and Behavior Modification. New York: Appleton-Century-Crofts, 1969.

43. Zifferblatt, Steven M. You Can Help Your Child Improve Study and Homework Behaviors. Champaign, Illinois: Research Press, 1970.

An exhaustive annotated bibliography of behavioral applications with parents and teachers, Behavior Modification in Child and School Mental Health, by Dr. Daniel G. Brown of the National Institute of Mental Health in Atlanta, Georgia is in press.

APPENDIX D

CENTERS OF ACTIVITY

IN

BEHAVIOR MODIFICATION

Appendix D
Centers of Activity

Work in the field of behavior analysis has become so extensive in the past decade, that there are now a number of "centers of activity" around the country. Several of these centers have already developed prototypes of demonstration sites and the capacity to develop one exists in still other, more recently formed centers of activity. The centers, which may or may not have a base in a formal organization, have certain common characteristics, however diverse they may be structurally.

They are generally centered around the psychology, education or human development departments of a university. The key individuals involved have had extensive experience in basic and applied behavioral research, may be teaching in the university, and/or may be applying the techniques of behavior analysis in a range of sites, including special and regular classrooms for children at all age levels. Some individuals have founded private schools themselves while others have a working relationship with the local public school system. One result of this work in the schools is that several practitioners have developed sophisticated in-service or even preservice teacher training programs. Several of these programs have been packaged or will soon be ready for dissemination. Most centers that have an involvement in the schools have designed behaviorally-based classroom management procedures and several are productively concerned with curriculum development as well. Other centers of activity oriented toward the community at large, may specifically stress preparation in the mental health professions and may sponsor walk-in clinics or provide consultant services to families, schools, or other community organizations. Frequently, there are both school intervention and mental health programs at a given center. Generally, all centers of activity maintain programs in basic research on various facets of the entire field of behavior analysis.

Highlights of the activities at fifteen major centers are summarized below. More detailed memoranda, provided by the centers themselves follow the summaries.

1) The Department of Human Development and Family Life, the University of Kansas

The key research psychologists here are among the most outstanding theorists and practitioners of behavior modification in the country today. Dr. Donald Baer was a pioneer in applied behavioral research and is an internationally recognized authority in early childhood education and language development. The efforts of Dr. Baer and his colleagues cover the entire range of concerns in education from basic research to applied efforts for all ages and groups. For example, projects in very early childhood education and in the development of evaluation procedures for education programs are being conducted by Dr. Todd Risley. (Since 1965 he has operated the Juniper Gardens Experimental Pre-School for culturally deprived black children), and has also directed the Osnam School for Delinquent Boys. Dr. R. Vance Hall has been developing behaviorally-based education programs for normal and exceptional children, grades K through 12. His college level, practicum course in behavior modification (Responsive Teaching) enrolls about 100 teachers, principals and guidance counselors each semester and his booklets "Managing Behavior," which form the core of the course, are now available in both English and Spanish editions. Dr. Montrose M. Wolf, whose focus has been in the area of special education, is currently engaged in the development of "Achievement Place," a model for community-based and community-directed homes for pre-delinquents. A behaviorally-based Head Start/Follow Through program is under the direction of Dr. Don Bushell. Approximately 20 school sites across the country are employing Dr. Bushell's Behavior Analysis

Program. Dr. B. L. Hopkins and Dr. Donald Green direct a Bureau of Education Personnel Development Triple T program, training consultant teachers in behavior modification techniques.

2. Behavior Research Company of Dr. Ogden R. Lindsley

Another nucleus of research psychologists is centered around Dr. Lindsley of the School of Education at the University of Kansas. Dr. Lindsley offers a university course at Kansas in "Precision Teaching," (a technique which stresses precise measurement of behavioral change), and he and his colleagues conduct teacher-training in this technique in various parts of the country. Changing Classroom Behavior: A Manual for Precision Teaching, a book prepared by one member of this group, Dr. Merle Meacham, has been available since 1969. Precision Teaching: An Initial Training Sequence edited by Harold P. Kunzelmann has just been published. Other members of the group include Eric Haughton, Norris Haring, Ann D. Duncan, and Thomas Lovitt. Although geographically dispersed, working at different universities across the country, these people are collaborating as well with Dr. Lindsley on the refinement of a comprehensive computerized system called a Behavior Bank. All published behavioral studies (using rate of response as a measure), as well as projects conducted by Dr. Lindsley's students and colleagues have been stored in the computer. Through this computer, subscribing teachers are able to advise each other on the attainment of particular classroom goals.

3) Central-Midwestern Regional Laboratory, Inc.--St. Louis, Missouri

The Instructional Systems Program

CEMREL has conducted research and development work in behavioral change procedures for the last several years. Dr. Robert L. Hamblin initiated

the program and guided the early work which focused on severely disturbed autistic children as well as children with behavioral and academic problems in more normal school settings. The results of this early work are summarized in The Humanization Processes, John Wiley, 1971. The program, now under the direction of Dr. David Buckholdt, is developing and testing three instructional products:

1) Classroom and Instructional Management (CLAIM)

   CLAIM is a teacher training program designed to instruct teachers in the use of reinforcement procedures in the classroom.

2) Teaching Autistic Children

   This training program for parents and therapists of autistic children provides a series of teaching strategies and stages for the resocialization and teaching of severely disturbed children.

3) Language and Thinking Program (LATP)

   LATP is an early childhood and elementary curriculum program designed to teach important language and critical thinking skills. The program includes reinforcement procedures for teaching these skills.

4) Washington, D.C. - Baltimore, Maryland Area

Several prominent research psychologists such as Dr. Charles Ferster (American University), Dr. Roger McIntire (Maryland University), and Dr. Donald Pumroy (Maryland University) are based in this area. In recent years, the concentration of young Ph.D.s active in research and ongoing projects in schools and hospitals has been great enough for many of them to meet informally to discuss their work. One example of a major program is the Anne Arundel County Learning

Center operated by the County School Board and attended by students who have had difficulty in County junior and senior high schools.

Several corporations have been founded in the area to provide the consultant services of behavioral psychologists to families, schools and other institutions. One of the oldest is the Institute for Behavioral Research in Silver Spring, Maryland. Incorporated in 1960 as an independent non-profit research and educational organization, IBR is an interdisciplinary institution established and administered by professionals interested in the development of behavioral technology and continued basic research in the analysis of human behavior. In addition to operating a variety of community projects, IBR supports an Experimental College offering a master's degree in Human Learning and pre-doctoral courses in specialized behavioral areas. Mr. Harold Cohen, author of a classic study on the rehabilitation of institutionalized juvenile delinquents, is president of the college, which offers late afternoon and evening courses and is thus available to teachers, counselors and other professionals.

5) Western Michigan University

The Department of Psychology here includes many prominent individuals who have been actively engaged in basic and applied behavioral research. Dr. Roger Ulrich, Research Professor, directs the Learning Village, a racially and economically integrated private school for some 75 students ranging from infancy through age 10. The goal of the program is to prevent social, emotional, and academic difficulties and accelerate learning by applying behavior modification techniques at an early age. Dr. Jack Michael has developed contingency management programs for college level instruction and lectures nationally to promote the use of individualized techniques of instruction at this level. Dr. Neil Kent operates the only NSF Institute in behavioral science, a summer program for high

school students considering a career in psychology. Dr. Robert Hawkins supervises a behavior modification program for special education classes in the Kalamazoo Valley Intermediate school district and is founder and editor of the "SALT JOURNAL" (School Applications of Learning Theory). Other faculty members have specialities in educational technology, mental health, language acquisition, industrial psychology and education of the handicapped.

6) University of Vermont

One program at this center under the direction of Dr. Hugh McKenzie is in its fifth year of operation and is funded by HEW's Bureau of Education for the Handicapped, Bureau of Educational Personnel Development, the State Department of Special Education, and local school districts. This rigorous two-year program is designed to prepare experienced elementary and special education teachers to apply behavior modification techniques in the classroom as consulting teachers. These consultants assist classroom teachers in working with special education or problem children within the regular public school classroom by helping the teacher diagnose the problem behavior and develop a strategy for dealing with it. Vermont school boards have become increasingly receptive to this plan of intervention and to Dr. McKenzie's contention that the very precise techniques of behavior modification through which change can readily be demonstrated provide a realistic approach to holding educators accountable. This training program is highly regarded in the field and stands as a model for training consulting teachers. A newer program offers preservice and inservice training in applied behavior analysis to elementary, secondary, and special education teachers. All the faculty of the Special Education Program are involved in basic research in learning variables. This work assists approximately 400 handicapped learners and their parents per year.

7) Southern Illinois University

The last 5 years have seen a large concentration here of psychologists expert in the techniques of applied behavior analysis. The pace has been set by Dr. Nathan H. Azrin who, with Dr. Teodoro Ayllon in the Behavior Research Laboratory of nearby Anna State Hospital, designed the first token economy as a step toward the rehabilitation of the mentally ill. Ayllon and Azrin's departure from traditional practice and the remarkable success they achieved in employing reinforcement techniques to prepare the mentally handicapped to return to the community, is regarded as a major break-through in the treatment of mental illness. Dr. Azrin is also professor in the Rehabilitation Institute of SIU and in the College of Education where several projects applying behavioral techniques in classrooms have been undertaken.

Work in behavior modification at SIU is concentrated in the College of Education, one of the Nation's largest producers of teachers and in the Rehabilitation Institute which offers an independent graduate degree program in behavior modification.

8) The Learning Research and Development Center, University of Pittsburg

The Center is an Institute of the University of Pittsburg and one of nine Research and Development Centers supported by the Office of Education. Ongoing research in behavioral science serves to give direction to the Center's development of individualized instructional procedures, materials and teacher training. Evaluation, as a built-in component, occurs concurrently with program design and instrumentation. The well-known IPI (Individually Prescribed Instruction), a system of programmed elementary level education, and PEP (Primary Education Project) for pre-schools were developed here. IPI and PEP together also comprise one of

the Office of Education's Follow Through models. While refinement of IPI and PEP continues, efforts are going forward on the design of prototype model elementary school environments for children ages 3 to 9. LRDC is engaged in the design of educational systems on the basis of psychological and behavioral analysis of learning and instructional requirements in a wide variety of domains. However, the specific educational practices developed do not always resemble, on the surface, procedures commonly recognized as "behavior modification."

9) University of Utah

Faculties of the Bureau of Educational Research, the Department of Educational Psychology, the Psychology Department, the Center to Improve Learning and Instruction and the University Medical School conduct service, training, and research programs in behavior modification. Projects include the development of personalized instructional techniques at the college level, studies on the use of operant techniques to promote creative endeavors, and service to entire public schools and classrooms covering preschool through adult education. The Bureau, sponsors "Study Systems," a behavioral program to assist minority students and students predicted to fail, and operates the Behavior Modification Training Center, a private school for young children labeled "disturbed" and "retarded." In conjunction with the Nebraska Conference on Early Childhood Education, the Bureau also operates an Institute to train college students in behavioral evaluation techniques. Behavior Modification projects are also conducted by organizations not formally affiliated with the University, notably the Veteran's Administration Hospital and Behavior Systems Corporation.

10) Florida State University at Tallahassee

Florida State offers a Ph.D. program in School Psychology that stresses the operant approach. This program, which receives support from NIMH, places heavy

emphasis on field experience at all levels of study. The result is a unique education "hierarchy" in which advanced students are responsible for training teachers in schools where they are placed and first or second year students work under these advanced students as e.g., psychology teacher aides. The designer of this hierarchical approach is Dr. Charles Madsen, who collaborated on several now classic studies on the influence of teacher attention on student behavior. Building on this original work, Dr. Madsen has, with Dr. Clifford Madsen of the Music Department, developed a model for teacher training that is both flexible in terms of the size of the workshop (900 attended a workshop last summer in Dade County, preparatory to school integration) and adaptable to various populations (workshops stressing the positive approach to their profession have been conducted for vocational rehabilitation counselors, industrial safety designers, the Council of Migrant Workers, and the entire National Council of Juven le Court Judges).

11) The University of Oregon--Eugene, Oregon

Training and research activities in the area of behavior modification at the University of Oregon are carried out in three settings:

1. The Special Education Department
2. The Psychology Department
3. Oregon Research Institute

The behaviorally-oriented training program in Special Education, supported by grant monies from the Bureau of Education for the Handicapped, offers Master's and Doctoral level students training in the areas of: (a) mentally retarded, (b) physically handicapped, (c) emotionally disturbed, (d) learning disabled, (e) administration of special education. Research projects in this Department that use behavior modification techniques include the Instructional Materials

Center, the Early Childhood Education Center for the Handicapped, and the Regional Resource Center. All three of these centers deliver educational therapeutic services to handicapped children in the public school setting and serve a five state area in the Northwest.

The Psychology Department trains master's and doctoral level students in behavior modification techniques through its clinical psychology program. The department maintains a psychology clinic and an active family therapy program. Federally-funded behavioral research projects include a study of the analysis of conflict parameters in social interaction and a study of behavioral similarity and generalization across-settings.

Oregon Research Institute is a university related, private research corporation adjacent to the Oregon campus. The institute is entirely dependent upon federally-funded research grants and employs primarily mathematicians and psychologists.

12) University of Washington, Seattle

Classroom applications of behavior modification at this center emanate from the Experimental Education Unit at the University of Washington in Seattle. The Experimental Education Unit under the direction of Norris G. Haring, is one of four units in the Child Development and Mental Retardation Center at the University and relates directly to the Center and to the College of Education. Kep projects at the Unit include:

The Program Project

The goals of the Program Project are to develop performance criteria, instructional materials, and procedures for teaching severely and multiply handicapped children; and to develop systematic curricula, performance criteria, instructional materials and procedures which will enable classroom teachers to

successfully integrate moderately handicapped children into the regular classroom milieu.

The Model Preschool Center for Handicapped Children--(With Professional Training, Research, and Service Components). Model Preschool goals are to provide a preschool center for handicapped children that helps them acquire skills and behaviors needed for participation in schools or other community programs, and to demonstrate, in a multi-disciplinary research and training center and in field settings, the application of scientific, systematic procedures in educating young handicapped children.

(Continuation Project) To Replicate Tested Models for Providing Diagnostic and Educational Services to Handicapped Preschool Children in Various Types of Communities. Project goals are to: 1) continue and improve the demonstration-service programs for handicapped preschool children and the training programs for professional and paraprofessional personnel at the Experimental Education Unit; 2) to lay the foundations for implementing UAF (University-Affiliated Facilities) Programs under the Developmental Disabilities Act and for developing a state network of comprehensive centers that would extend diagnostic and educational services to young handicapped children; and 3) to establish new programs or to improve existing programs based on three tested models (integrated, self-contained, and itinerant-coordinator/trainer) for serving preschool handicapped children (ages 0-6) and their families in various types of communities (e.g., rural, semi-rural, low-income, minority).

13) State University of New York at Stony Brook

Stony Brook offers a clinical psychology program leading to a Ph.D. as well as a post-doctoral program in behavior modification. There is a strong

emphasis on behavior modification in the clinical psychology program and students may specialize in work with children or adults. A Psychological Center encompassing units for students, adults and children serves as the major source of campus clinical training. A University Laboratory School for children with academic and social problems also provides a training facility. The program has 14 full-time faculty and several associates who provide clinical supervision.

Examples of faculty whose professional concerns have influenced the role of behavior modification in clinical psychology education are: Dr. Gerald Davison, president-elect of the American Association for the Advancement of Behavior Therapy; Dr. Robert Liebert, co-author with John Neale and Emily Davidson of The Early Window a study of the effects of television violence upon the young; Dr. Leonard Krasner, co-author with Dr. Leonard Ullman of Case Studies in Behavior Modification (1965) and A Psychological Approach to Abnormal Behavior (1969); Dr. Daniel O'Leary who has completed many research projects on token reinforcement programs with children; and Dr. Alan Ross, Director of the Clinical Psychology Program.

Research in behavior modification includes: (1) Operant control of autonomic responses of adults with sexual problems; (2) Modeling of aggression and sharing; (3) Token reinforcement programs in schools and hospitals with both children and adults; (4) architectural design of classroom environments; (5) Maintenance of behavior following drug induced change; (6) Social problem solving behavior of college students with interpersonal and academic problems.

14) Drake University

Drake University, in Des Moines, Iowa, is a relatively new center of activity where work in behavior modification has been developing for the last three years. There are two graduate programs in applied behavior analysis, Behavior Modification and School Psychology. Both are intended to graduate professionals at the Master's Degree level. Faculty members on the behavior modification staff include Drs. Jon Krapfl, Scott Wood, and Margaret Lloyd, with Dr. Donald Carr, a school psychologist, and Elaine Burgess, counseling psychologist, as Adjunct Professors. There are currently 36 students in these behavioral programs.

In addition to content courses, the Behavior Modification and School Psychology programs each include a supervised practicum and a second year "internship" experience in any one of several areas of application. Facilities which provide supervised behavior modification experience include the Psychology Department's behavior modification treatment center as well as several school and hospital facilities in the surrounding area.

The Psychology Department also serves as a resource center for the development of behaviorally-based instructional methods, and is itself rapidly converting to systems of individualized instruction for many of its graduate and undergraduate courses.

15) Individual Learning Systems, San Rafael, California

Individual Learning Systems is a behavorially-based educational products corporation established by a group of research psychologists, notably Drs. Don Tosti and Lloyd Homme, who have been active in the field of

programmed instruction and behavioral education procedures for more than ten years. ILS "products" include individualized college courses, college teacher-training workshops and other programmed instructional materials. It provides consultant services to local, state and Federal educational agencies and commercial clients and also operates a non-profit school for grades K-12. Other educational corporations which prepare programmed materials and promote behaviorally-based teaching/learning procedures include:

General Program Teaching Corporation
San Rafael, California
under the direction of David Cram

J. Harless Associates
Silver Springs, Maryland

Deterline Associates
Palo Alto, California

Educational Design Inc. (EDI)
New York City
under the direction of Dr. Stuart Margolis

Praxis Corporation
New York City
under the direction of Geary Rumler
and Dr. Thomas Gilbert

MMI (Modern Methods of Instruction)
Albuquerque, New Mexico
under the direction of D.E. Cornell

Alpha Learning
Albuquerque, New Mexico
under the direction of Brian K. Freeder

American Analysis Company
San Francisco, California
under the direction of Dr. Peter Lenn

LUDI
New York City
under the direction of Dr. Stuart Margolis

EnteLEK Inc.
Newburyport, Massachusetts

Rehabilitation Research Inc.
Elmore, Alabama
under the direction of Dr. John McKee

The Work Group was not able to compile detailed information on other centers of activity but the extent of the work elsewhere should be defined prior to any concrete planning by the Department, e.g., for the establishment of demonstration sites. Academic centers include:

University of Arizona
(Ralph Wetzel)

University of California
at Los Angeles
(Ivar Lovaas and Martha Bernal)

University of Minnesota
(Wells Hively and Travis Thompson)

University of Illinois at Champaign-Urbana
(Sidney Bijou and Leonard Ullmann)

University of Illinois at Chicago Circle
(Susan Markle)

University of North Carolina
(Barbara Waskik)

University of Alabama at Tuscaloosa
(Henry Rickard and Michael Dinoff)

University of Chicago
(Israel Goldiamond)

University of Hawaii
(Arthur Staats)

Yeshiva University
(Paul Graubard & Ann D. Duncan)

Georgia State University
(Teodoro Ayllon)

University of West Virginia at Morgantown
(Julie and Ernst Vargas)

Rochester University
(Stanley Sapir)

Northeastern Connecticut Area
University of Connecticut and Mansfield State
Training School
(Norman Breyer, Jack Thain, Beth Sulzer-Azaroff)

Stanford University
(Albert Bandura)

MEMORANDA OF

SELECTED CENTERS OF ACTIVITY IN BEHAVIOR MODIFICATION

1. The University of Kansas - Lawrence, Kansas
2. The Behavior Research Co. of Dr. O. R. Lindsley - Kansas City, Kansas
3. Central Midwestern Regional Laboratory - St. Ann, Missouri
4. The Washington, D. C. - Baltimore, Maryland Area
5. Western Michigan University - Kalamazoo, Michigan
6. The University of Vermont - Burlington, Vermont
7. Southern Illinois University - Carbondale, Illinois
8. The Learning Research and Development Center, University of Pittsburgh - Pittsburgh, Pennsylvania
9. The University of Utah - Salt Lake City, Utah
10. Florida State University - Tallahassee, Florida
11. The University of Oregon - Eugene, Oregon
12. The University of Washington - Seattle, Washington
13. The State University of New York at Stoney Brook, Long Island, New York
14. Drake University - Des Moines, Iowa
15. Individual Learning Systems--San Rafael, California

The Department of Human Development and Family Life at the University of Kansas has developed a program of training and research with a strong applied behavior analysis or behavior modification component over the past several years. The Department Chairman is Dr. Frances Horowitz, well-known for her research with infants.

Among the persons in the Department who are supervising projects and programs of research which are related to the field of education are:

Donald M. Baer with Barbara Etzel, Judith LeBlanc and Donald Green who supervise early childhood development research in the campus preschool in Lawrence. Dr. Baer is also active in language development research and research with children with severely deviant behavior in classrooms at the Kansas Neurological Institute.

Emily Herbert supervises a behavior modification training program for parents in conjunction with the University of Kansas preschool. Dr. LeBlanc and Dr. Green also act as consultants to behavior modification programs in Lawrence, Kansas elementary schools.

Montrose Wolf with Elery Phillips and Dean Fixsen has supervised a research and training program based on the Achievement Place Model of community-based, community-directed homes for predelinquent boys for the past several years. Teaching parents are taught to use reinforcement procedures for modifying social, academic, self-care and pre-vocational behaviors. A major component in each of the Achievement Place type houses is to use home based behavior modification procedures to increase appropriate school behavior and academic performance. Dr. Wolf (with Ed Christopherson) also directs the Remedial Reading Laboratory at Juniper Gardens where the effects of systematic tutoring procedures on reading skills of elementary pupils are analyzed, and supervises research of graduate students investigating the effects of various modification procedures on behavior of public school pupils.

Donald Bushell, Jr. supervises an extensive experimental program which is investigating the effects of using an applied behavior analysis approach to training teachers, developing and evaluating programmed materials, and increasing the performance of kindergarten through third grade pupils in Head Start and Follow Through programs in nine centers throughout the country. Dr. Bushell's project sponsors a behavior modification applications in education seminar at the University of Kansas each year.

Todd R. Risley directs Turner House Preschool, a Juniper Gardens Children's Project program. Emphaiss is placed on investigating language behavior of poverty preschool children and developing procedures for increasing language and other skills related to future academic success. He also supervises a day-care research program designed to implement procedures for analyzing how well day care centers carry out planned activities and how systems can be developed for improving active participation by day-care children. Dr. Risley also supervises behavior modification research in two special classrooms for disturbed and delinquent boys who have been expelled from the public schools.

Donald Green and Bill Hopkins direct a TTT program which is designed to provide skills in applying and teaching behavior modification techniques. Those enrolled in this program are working with HDFL Department members in an apprenticeship arrangement. The objective of the program is for participants to return to their parent institutions and school districts to teach other teachers behavior modification techniques. Dr. Hopkins also supervises a behavior modification research program in a Lawrence, Kansas elementary school.

R. Vance Hall supervises a research program at Juniper Gardens in Kansas City, Kansas which is designed to investigate and implement behavior modification procedures in schools, classrooms, and homes of poverty area pupils and which has resulted in

the development of the Responsive Teaching Model. Current research includes programs in elementary, junior and senior high classrooms in Kansas City, Kansas, Shawnee Mission, Bonner Springs, Topeka and Shawnee Unified school districts. These involve teachers, counselors and principals and includes research in the areas of social, tangible and token reinforcement, and the effects of feedback, instructions and praise on teacher behavior. Other research and training includes an investigation of the role of the school psychologist as a behavior modification consultant to teachers of the handicapped (with Dr. Herbert Rieth) and a course in how to apply behavior modification principles for teachers, principals and counselors (approximately 90 per semester). Another research thrust (with Dr. Jasper Harris and Dr. Rodney Copeland) is the development of a "Responsive Parent" program for teaching parents to apply behavior modification procedures in the home.

More than 50 Department of Human Development and Family Life graduate students are directly involved in these education related behavior modification programs.

There are also behavior modification oriented staff members in the Department of Education at K.U. Many of their students take HDFL courses and are also involved in behavior modification research.

Submitted by R. Vance Hall

Dr. O. R. Lindsley

Behavior Research Company

Kansas City, Missouri

PRECISE BEHAVIORAL MANAGEMENT SYSTEM

This descriptive system was designed to increase the precision (x 10) and efficiency (x 10) of the applied behavioral fields of education, psychology, psychiatry, social work, medicine, and nursing and at the same time to provide precise communications between these professions and the parents and children they serve. The system is now in its 5th year of development and is beginning to reach its goals. The system uses a common:

Language....Basic English
Record....Frequency of Performance
Datum....Acceleration of Performance
Chart....Daily Frequency (Ratio-ruled)
Storage....Behavior Bank (Computerized)
Communication....Behaviorgrams (Computerized)

The extremely large storage capacity of the high speed computer permits researchers and practitioners to share their basic observations (raw data) for the first time. Thus detailed questions can be answered by the computer in equal detail, eliminating the need for generalizations. Also tomorrow's questions can be answered from yesterday's data.

The core of the system is the Standard Daily Behavior Chart (which can be easily kept by kindergarten children). This ratio-ruled chart shows speed, accuracy and improvement of any classroom academic skill or behavior problem. Behavior frequencies as high as 300 per minute or as low as one per day have their places on the chart.

Since behavior frequencies grow and decay in multiples, outcomes of current teaching procedures can be estimated by the children and teachers at any time in the classroom by merely drawing straight lines on their ratio-ruled charts.

The Daily Behavior Chart also provides additive and homogenous variance of behavior frequencies both within a child (from day-to-day) and across children in the same or different classrooms. This inexpensive (under $10 per child per year) and practical system for directly and completely recording classroom performance provides Education with a measurement system which can be used to analyze and manage the unique qualities of each learner as well as to summarize and evaluate the performance of large samples of school children. Daily classroom performance norms are beginning to accumulate in the Behavior Bank (6,000 projects stored to date).

The system has been taught to elementary school children in a few days, to teachers in 10 weekly three-hour meetings, and to doctoral level professionals in 5 full days.

Ogden Lindsley, Ph.D.
October 13, 1970

TOOLS FOR A PRECISE BEHAVIORAL MANAGEMENT SYSTEM

DIRECTING A PROGRAM

- Standard Charts
- Standard Language (English)
- Standard Forms & Files
- Behavior Bank will summarize projects
- Total cost about $1.00 per behavior change

TRAINING ADVISERS & MANAGERS

- Must manage or advise projects (at least 2 on self)
- Conduct 2 hour weekly or biweekly classes
  - 10 to 50 in a class
  - projects presented at each meeting (0.5 projects per minute)
- Overhead Projector
- Transparencies
  - Behavior Chart
  - Clear
  - Principles
  - Forms
  - Other Projects
- Instruction Frames
- Behavior Bank
  - Check Progress
  - Summary and Comparison
- Certificates

MANAGING BEHAVIORS

- Four Steps to Success
- BEHAVIOR CHART --most important
- Counters and Timers
- Precise Management Principles
- Is-Did -- functional description
  -- for analysis
- Acceleration -- Course Charting
- BDA -- Before - During - After
- Direct Comparison -- During three
- Behavior Bank
  - Goals
  - Procedures
  - Store Projects
- Describing Collections

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Central Mid-Western Regional Laboratory

St. Ann, Missouri

CEMREL, Inc. has, over the past five years, initiated work on behavioral change procedures as part of its work in the Instructional Systems Program (ISP). The program has undertaken both research and development work in the area of behavior analysis.

Research:

1. Preliminary research into the practical problems of home managed contingencies
2. Research on the relationship between attending behavior ("appearing to work") and actual work accomplished
3. Research on the effects of peer tutoring on academic performance
4. Research on the effects of group contingencies on functional classroom behaviors and on academic performance

Development:

1. Work is nearing completion on a training program in reinforcement procedures for the classroom. The program is called CLAIM, Classroom and Instructional Management. The program consists of written units, behavioral exercises for teachers, audio-visual units, and a coordinators manual. The topics of the units are as follows:

   1. Introduction to Behavior Analysis
   2. How to Talk About Behavior Analysis
   3. How to Select Positive Reinforcers

4. How to Measure Behavior
5. How to Use Social Reinforcement
6. How to Design a Token Economy
7. How to Start, Maintain, and Trouble-Shoot a Token Economy
8. How to Use and Misuse Aversive Consequences
9. How to Manage a Behavioral Analysis Classroom
10. How to Guide and Plan for a Behavior Analysis Classroom

The coordinators manual will allow a school psychologist or counselor to manage the training. The program is undergoing final testing and revision in the 1972-73 school year and should be complete by September, 1973. The program will be appropriate for both in-service and pre-service training.

2. A second development effort is focused on a training program for therapists and parents of autistic children. Fifteen prototype training units have been completed. They are listed below:

1. Introduction to Behavior Analysis
2. Measuring Behavior
3. How Parents Can Use Behavior Analysis
4. How to Work With Disruptive Behavior
5. Developing Eye Contact Behavior
6. Developing Simple Manipulative Tasks
7. Developing Motor Imitation
8. Developing Spontaneous Speech
9. Phoneme Expansion
10. Developing Verbal Imitation
11. Developing Functional Speech
12. Syntax Acquisition
13. Initial Group Experiences
14. Intermediate Group Experiences
15. Advanced Group Experiences

The units will be tested and revised in a variety of home and institutional settings in the next two years.

3. The third development effort of the Instructional Systems Program is an early childhood and elementary language and conceptual skills training program. Although primarily a curriculum program, some reinforcement procedures are built-in for strengthening basic language and thinking skills. The ten units of the Language and Thinking program are given below:

   1. Let's Start
   2. Colors
   3. Shapes
   4. Sizes
   5. Directions
   6. Blends
   7. Action
   8. Functions
   9. Classification
   10. Relevant Learning Experiences

   This program will be available commercially in September, 1973.

Submitted by Dr. David Buckholdt

The Washington, D. C.--Baltimore, Md. Area

BEHAVIOR MODIFICATION ACTIVITIES IN THE BALTIMORE-WASHINGTON AREA

There is no single administrative body which coordinates the activities of behavior modifiers in this area. On a regular, but informal basis, a monthly meeting of about 40 professionals involved in behavioral programs and activities is held. Many of the professionals doing behavioral work are involved in several endeavors. This survey will list activities and those persons involved in them.

I. INSTITUTIONS - WARD MANAGEMENT AND STAFF TRAINING

These activities involve designing contingency management systems in mental hospitals and building behavior development programs for the hospital in-mates. Training of the professionals and paraprofessionals in the techniques of Behavior Modification is also accomplished.

1. Sam Berkowitz - Crownsville State Hospital
2. Bruce Hutchison - Eastern Shore State Hospital (Cambridge, Md.)

II. SPECIAL SCHOOLS - CONTINGENCY MANAGEMENT, WORK WITH CHILDREN LABELLED EMOTIONALLY DISTURBED, RETARDED, ETC.

These activities generally involve intensive individualized programs for the behavioral development of children rejected from other educational settings. Programs for parents are generally established.

1. Philip Drash - JFK Institute (Baltimore, Md.)
2. Richard Kleiner - School for Contemporary Education (McLean, Va.)
3. Artha Hoffarth - School for Contemporary Education (Ellicott City, Md.)
4. Shlomo Cohen - National Children's Center (Washington, D. C.)
5. William Brown - Anne Arundel Learning Center (Annapolis, Md.)
6. Sherman Brett - Victor Cullen School (Sabillasville, Md.)

III. REGULAR PUBLIC SCHOOLS - CONTINGENCY MANAGEMENT, TEACHER TRAINING

These activities involve consultation in building programs for "special" children, training of school staff in behavior modification, and the conduct of research.

A. NURSERY AND DAY CARE

1. Don Pumroy - School Psychology Program (University of Maryland)

B. ELEMENTARY SCHOOLS

1. Don Pumroy - School Psychology Program (University of Maryland)
2. Roger McIntire - Department of Psychology (University of Maryland)
3. Shlomo Cohen - Project DILE (Center for Behavior Change and Development) D. C. Schools

C. SECONDARY SCHOOLS - TEACHER TRAINING, CONTINGENCY MANAGEMENT, CONSULTATION

1. Don Pumroy - School Psychology Program (University of Maryland)
2. Mike Boyle - Center for Supplementary Education (Harve de Grace, Md.)
3. Harold Cohen - Institute for Behavioral Research (Silver Spring, Md.)

D. COLLEGES AND UNIVERSITIES - TEACHING IN BEHAVIOR MODIFICATION

1. Don Pumroy - School Psychology Program (University of Maryland)
2. Roger McIntire - Department of Psychology (University of Maryland)
3. John Boren - American University
4. Charles Ferster - American University
5. Sam Berkowitz - Anne Arundel Community College
6. Stephanie Stolz - Medical School, Johns Hopkins University

IV. TRAINING OF PARENTS AND OTHER PARAPROFESSIONALS (AND PROFESSIONALS)

These activities involve regular meetings with groups of parents, teachers, and others, to develop the child-rearing skills of these adults. These meetings are frequently part of on-going projects.

1. Mike Boyle - Center for Supplementary Education (Harve de Grace, Md.)
2. Don Pumroy - School Psychology Program (University of Maryland)
3. Artha Hoffarth - School for Contemporary Education (Ellicott City, Md.)
4. Dave Williams - School for Contemporary Education (McLean, Va.)
5. Shlomo Cohen - National Children's Center (Washington, D. C.)

V. ORGANIZATIONS INVOLVED WITH BEHAVIOR MODIFICATION

These organizations are involved in behavioral consultation to area agencies and in the conduct of research.

1. Center for Behavior Change and Development (Langley Park, Md.)
2. Behavior Service Consultants, Inc. (Greenbelt, Md.)
3. Behavior Science Associates, Inc. (Baltimore, Md.)
4. Institute for Behavioral Research (Silver Spring, Md.)
5. Behavior Technology Consultants, Inc. (Silver Spring, Md.)

VI. PROFESSIONALS ACTIVE IN BEHAVIOR MODIFICATION NOT APPEARING ELSEWHERE IN THIS DOCUMENT

1. Sue Whalen - Towson State Teachers College (Department of Psychology)
2. Sally Sibley - School for Contemporary Education (McLean, Va.)
3. Tim Ellsmore - Walter Reed Army Hospital
4. Harold Wiener - St. Elizabeth's Hospital
5. Saleen Shah - NIMH
6. J. Michael Keyworth - Baltimore Association for Retarded Children

Presently, there is no umbrella organization which unites all of the above professionals. Some less formal interactions and communications are fostered by colloquia at the Anne Arundel County Learning Center, the School Psychology Program at the University of Maryland, and a monthly meeting of approximately 40 professionals interested in Behavior Modification. These meetings are coordinated by Shlomo Cohen.

Submitted by:

Shlomo Cohen
Center for Behavior Change
and Development
P.O. Box 1012
Langley Park, Maryland 20787

INSTITUTE FOR BEHAVIORAL RESEARCH, INC.

Silver Spring, Maryland

The Institute for Behavioral Research (IBR) was incorporated in 1960 as a private, not-for-profit research and educational organization. Its mission is to increase scientific understanding of behavior and to formulate this understanding into a socially applicable technology of behavior.

Research Staff and Strategy

The Institute is a multidisciplinary research community. Its principal investigators represent the fields of experimental and clinical psychology; behavioral architecture and environmental planning; education; physiology, biophysics, and pharmacology; and analytic and social psychiatry. Approximately a third of the staff members hold degrees at the doctoral level.

The research strategy of the Institute calls for simultaneous conduct of basic and applied research, and for application of behavioral techniques through innovative educational programs.

Behavioral Learning Centers

The Behavioral Biology Center conducts fundamental research into the interrelationships of the physiological and psychological phenomena involved in the behavior of both animals and humans. A primate colony and facilities for other species are maintained to provide animal subjects for the investigations. Current work includes studies of the contribution of sensory feedback to movement and learning, and behavioral compensation for sensory rearrangement (e.g., the ability to adapt to certain types of visual distortions). Other activities are directed toward enabling human beings to establish operant control over local vasomotor responses, and thus to control the blood flow through a given region of the body.

The Early Learning Facility (ELF) is a learning center for preschool children in which learning experiences are programmed to stimulate and improve the child's learning and thinking capabilities. In addition to the free-play activities usual in nursery schools, the program includes programmed activities in the development of language, mathematical concepts, and temporal concepts.

The Diagnostic and Learning Center (DIAL) is a community resource for elementary, junior high school, and high school students who are having school behavior problems and difficulty with school subjects. Its purpose is to remediate performance in one or more academic areas, to improve the student's individual and classroom study habits, and to promote classroom-appropriate behaviors.

The Student Learning Center was established in 1971 to offer teachers training in behavior modification techniques and consultation on the application of behavioral principles to specific classroom problems.

The Experimental College of the Institute for Behavioral Research (EC:IBR) has been in operation for two years and is accredited by the State of Maryland. It provides specialized education in operant psychology and behavioral design as applied to higher education. It offers a Master of Arts degree program in human learning.

Ongoing Projects

PICA (Programming Interpersonal Curricula for Adolescents) is a research project conducted to develop remedial procedures for adolescents designated by their schools as disruptive, unmanageable, and on the verge of dropping out or being expelled. The students spend half their day in PICA and the other half in their regular classes. In PICA, behavioral support techniques are used to direct the students' behavior to constructive ends. Incentives to work and to behave appropriately are provided through contingency management. Interest is stimulated, maintained, and directed through fusion of academic skills and emphasis on relevant subject matter. Programmed instructional materials are used to individualize the educational experience and enable the student to work at his own pace. Classes, seminars, and cooperative work projects afford opportunities for acquiring and exercising interpersonal skills.

PREP (Preparation through Responsive Educational Programs) is a demonstration and teacher-training program in PICA-developed techniques, procedures, and materials, now being conducted at a local junior high school in Montgomery County, Maryland.

BPLAY (Behavioral Programs in Learning Activities for Youth) is a three-year preventive delinquency program, conducted in the northwestern section of Prince George's County, Maryland. It offers after-school programs designed to guide adolescents into constructive, personally rewarding, and socially acceptable activities.

MATE (Methods Applicable to the Training of Educators) is a MICRO Project under the Clark University Training Complex. Its purpose is to train educators to use operant and behavior design techniques in dealing with managerial and educational problems in school classrooms.

Interpersonal Skills Curriculum Development

TARR (Teenagers' Rights and Responsibilities) is a curriculum presenting the legal system as a major model for problem avoidance and solution. It presents factual information on the law and legal processes to explain the philosophy of law and the rationale for a system of laws.

The "How To" Curriculum deals with general skills useful in all academic classes--how to follow oral, written, and visual instructions; how to classify; how to take tests; how to use the library--and with more specific skills applicable to particular subjects.

The Problem Solving Curriculum deals with the identification of problems in interpersonal relations and with possible methods of solving or mitigating these problems by changing a behavior of self, family member, friend, or community member.

PAD (Preventing the Abuse of Drugs) presents factual information about drugs and describes, without moralizing, the large-scale physical, psychological, and social problems that may be consequences of certain kinds of social behavior with respect to drugs.

The Operant Behavior Curriculum teaches methods that students can use to control their behavior and change it when necessary. The course materials are based on fundamental operant principles as applied to situations that students may encounter.

The Contemporary Scene Curriculum is designed to provide students with opportunities to learn how to analyze conflict situations and solve different kinds of problems. Short stories are used as the principal medium, but films, film strips, and games are also employed.

Submitted by Harold L. Cohen, Executive Director
Institute for Behavioral Research, Inc.

Western Michigan University

Kalamazoo, Michigan

WESTERN MICHIGAN UNIVERSITY

PSYCHOLOGY DEPARTMENT
Frederick P. Gault, Chairman

KALAMAZOO, MICHIGAN 49001

Training in behavior modification at Western Michigan University is offered in three programs of study. The thirty-hour masters degree in applied behavior analysis and educational technology is designed with an experimental emphasis to prepare the student for entrance into a doctoral program at another university. The 60-Hour masters degree in clinical psychology is a pre-professional program which may be taken with an emphasis upon behavior modification. This program is designed to prepare students for employment in a mental health setting. The 60-Hour Specialist Program in School Psychology includes the behavior modification courses within the Department, traditional testing skills, and supporting courses from the School of Education. Successful completion of this programs meets the requirements for state certification as a School Psychological Examiner. The degree sequence in each program combines formal course work within the Department with various practicum experiences in facilities in the immediate vacinity. The requirements are sufficiently flexible to accomodate students with diverse interests.

PRACTICUM FACILITIES IN BEHAVIOR MODIFICATION

Educational Technology and College Teaching.

While many of the staff members are interested in the technology of teaching and routinel conduct courses according to contingency management formats, remedial exam procedures anc self-pace programs, the major contributors in this area are Drs. Fred Keller, Jack Michae and Richard Malott. Following the publication of "Goodbye Teacher" which provided the initiative for many of the changes in instruction at a national level, Fred Keller continues to be an active advisor. Jack Michael has developed programs for college level teaching and graduate students have worked directly with him in designing courses within the University and the Community College. Both Fred Keller and Jack Michael have receive awards for their contributions to teaching from the American Psychological Association. Richard Malott is responsible for the introductory psychology course and the Student Centered Education Project. Many graduate students are active in these courses which continue to promote research in instructional techniques.

Local School District.

There are several projects in classroom management and the utilization of operant techniques in the school system which are in progress in the Southwestern Michigan Area. Many of these projects are outgrowths of the courses which the Department teaches through the Division of Continuing Education at the University. A typical situation is the Schoolcraft Community Schools in which an "in-service course" was taught for the teachers and has been followed by classroom operant conditioning projects and the utilization of numerous graduate students in advisory roles to the teachers working on these projects. Dr. Howard Farris who teaches courses in educational technology for teachers, and offers graduate training in programmed instruction, serves as an advisor for many of the project:

Kalamazoo Valley Intermediate School District.

This is a county-wide special education agency which coordinates programs in all of the school districts in the county. Dr. Robert Hawkins supervises a program for "emotionally

sturbed" children through this agency as well as a number of programs designed to each classroom management to teachers in the various systems. The School Adjustment Program for the "emotionally disturbed child" is functioning within the Kalamazoo School System, and employs a number of graduates from the University.

The Learning Village.

Dr. Roger Ulrich administers an experimental school which emphasizes the use of programmed teaching and operant methodology. This school has some professional teachers and some graduate students who are learning the techniques of behavior modification. The student body is composed of children whose parents are paying tuition and students whose parents are on A.D.C., thus, giving the school a heterogeneity of student body. A number of graduate students who have been associated with the school are now employed in community action programs and similar community-oriented agencies.

Kalamazoo State Hospital.

Dr. E. Wade Hitzing has an experimental laboratory ward in which patients are working within the framework of a token economy. The program is almost exclusively staffed with students from the Behavior Modification Program at the University. Dr. Hitzing teaches courses at the Hospital for regular University credit which are oriented around the application of operant technology in a state instituion and the training of institutional staff persons.

The Coldwater State Home.

Louise Kent supervises a program in early language acquisition and speech therapy based upon operant methodologies. The program affords opportunities for students to work with a population of severely handicapped individuals not generally available outside of the institutional setting.

Title VI Program for Multiply Handicapped Children.

This program is directed by James Kaye, a graduate of Western Michigan University. Although the program is not formally associated with the University, a large number of graduate students work at the setting, gaining experience in the application of behavior modification procedures and other skills necessary to work with multiply-handicapped children.

Project "HELP".

Dr. Neil Kent directs Project "HELP" which is designed to help students from the local school system who are experiencing reading, math or other academic difficulties. Graduate students serve as project directors and have the opportunity to work with individual children utilizing a behavior modification format.

Parent-Child Clinic.

Dr. Hermann Peine recently joined the staff and is establishing a parent-child consulting clinic designed to correct behavioral problems in the child and train parents in the use of behavior modification procedures.

Experimental Analysis Research Laboratories.

The Behavior Modification Program is supported by a number people in basic experimental

analysis of behavior. The Department emphasizes the basic research skills, and all students in the applied area are required to complete credits in research areas which serve as the foundation of behavior modification.

THE FACULTY.

Gault, Frederick P., Ph.D., Indiana 1958, Department Chairman; Physiological Psychology, Brain & Behavior.
Ulrich, Roger, Ph.D., Southern Illinois 1961, Research Professor, Behavior Modification, Aggression & Social Systems.
Keller, Fred, Ph.D., Harvard 1931, Visiting Professor; Experimental Analysis of Behavior, Educational Technology.
Asher, Jack E., Ph.D., Purdue 1954, Professor; Industrial Psychology, Statistics.
Fatzinger, Frank A., Ph.D., Purdue 1951, Professor; Industrial Psychology, Perception.
Fuller, Paul, Ph.D., Indiana 1952, Professor; School Psychology, Behavioral Assessment.
Kent, Neil D., Ph.D., Indiana 1958, Professor; School Psychology, Educational Technology.
Koronakos, Chris, Ph.D., Nebraska 1956, Professor; Theoretical Psychology, History & Systems.
Michael, Jack, Ph.D., California 1955, Professor; Behavior Modification, Educational Technology.
Mountjoy, Paul T., Ph.D., Indiana 1957, Professor, Theoretical Psychology, History & Systems.
Robertson, Malcolm Ph.D., Purdue 1955, Professor; Clinical Psychology, Counseling.
Schmidt, Richard Ed.D., Oklahoma State 1953, Professor; Industrial Psychology, Personnel Selection.
Farris, Howard, Ph.D., Michigan State 1964, Associate Professor; Comparative Psychology, Educational Technology.
Lyon, David O., Ph.D., Indiana 1963, Associate Professor; Experimental Analysis of Behavior, Aversive Control.
Malott, Richard, Ph.D., Columbia 1963, Associate Professor; Experimental Analysis of Behavior, Educational Technology.
Nangle, John, Ph.D., Michigan State 1961, Associate Professor; Industrial Psychology, Human Factors.
Snapper, Arthur, Ph.D., Columbia 1962, Associate Professor; Experimental Analysis of Behavior, Physiological Psychology.
Hawkins, Robert, Ph.D., Pittsburgh 1965, Associate Professor; School Psychology, Behavior Modification.
Huitema, Bradley, Ph.D., Colorado State 1968, Assistant Professor; Industrial Psychology, Statistics.
Peine, Hermann, Ph.D., Utah 1971, Assistant Professor; Behavior Modification, Developmental Psychology.
Hutchinson, Ronald, Ph.D., Yale 1962, Adjunct Associate Professor; Kalamazoo State Hospital, Experimental Analysis of Behavior, Physiological Psychology.
Hitzing, E. Wade, Ph.D., Florida State, Adjunct Assistant Professor; Kalamazoo State Hospital, Behavior Modification, Abnormal Behavior.
Kent, Louise, Ph.D., Iowa 1966, Adjunct Assistant Professor; Coldwater State Home for Retarded Children, Behavior Modification, Language & Retardation.

Submitted by: David O. Lyon, Ph.D.
Chairman, Graduate Training Committee
Department of Psychology
Western Michigan University
Kalamazoo, MI. 49001

The University of Vermont

Burlington, Vermont

SUMMARY OF THE UNIVERSITY OF VERMONT'S
PERSONNEL AND ACTIVITIES IN
APPLIED BEHAVIOR ANALYSIS
IN EDUCATION
College of Education
Special Education Program

Faculty

Ph.D.: Wayne L. Fox, Edward M. Hanley, Hugh S. McKenzie

M.Ed.: Carol S. Burdett, Lu S. Christie, Ann N. Egner, Martha F. Knight, Betty Jane Lates, Phyllis F. Perelman, Phyllis W. Paolucci, Betsy M. Schneider

Training

1. In a two-year M.Ed. program, the faculty trains experts in applying behavior modification to education. These experts, called consulting teachers, are hired by school districts in Vermont to consult with and train elementary teachers and parents in the application of behavior modification to promote the social and educational growth of handicapped learners in regular classes.
2. Inservice and preservice courses in principles and applications of applied behavior analysis are offered to elementary, secondary, and special class teachers.
3. Through consultation and workshops, program faculty and consulting teachers-in-training provide training to personnel dealing with the education of a wide range of handicapped children.

Research

1. All faculty of the Program are engaged in basic research aimed at determining variables functional in promoting social and educational growth of elementary school children, particularly handicapped learners. Current research includes the investigation of discrimination training procedures, behavior shaping, reinforcers readily available

to classroom teachers, and setting events which facilitate learning. Behaviors of primary concern include language, arithmetic, and social behaviors.

2. Under the direction of Martha Knight and Betty Jane Lates, a research and development project is underway to provide preschool handicapped learners with the minimum skills required to succeed in first grade. This project is researching methods to train parents in applied behavior analysis so that they can teach their preschool children requisite basic motor, perceptual, language, self-care, and social behaviors.
3. Under the direction of Ann Egner and Phyllis Paolucci, a research and development project in secondary special education is being undertaken. This project seeks to develop techniques and delivery systems for effectively educating handicapped learners of secondary school age, while maximizing integration into regular secondary programs.
4. Under the direction of Edward Hanley, procedures to train parents to more effectively manage handicapped learners at home, as well as assist schools in the education of these children, are being researched and developed.

Service

Each year it is projected that the Program will serve over 400 handicapped learners and their parents through the Program's training and research activities.

Submitted by:

Hugh S. McKenzie
Chairman, Special Education Program
College of Education
University of Vermont

Southern Illinois University

Carbondale, Illinois

Southern Illinois University

Southern Illinois University has a lengthy history of supporting behaviorally oriented programs in education. The majority of the work done at SIU has been accomplished through the College of Education, the Rehabilitation Institute, and the Design Department. The funding of projects through these units has been by departmental allocation, the Office of Research and Projects on campus, and a variety of public and private agencies. The College of Education is one of the nation's largest producers of teachers. They have adopted a behaviorally oriented course as a requirement in their teacher education programs, and they currently have under consideration performance-based criteria for certification of graduates. Behavioral research activities within the College are centered in the Departments of Special Education and Educational Psychology. Recent research activities include: 1) effects of various testing and assignment schedules on amount and spacing of study behavior; 2) effects of token reinforcement systems on intrinsically motivated students; 3) refinement of token reinforcement procedures as motivators toward academic achievement; 4) studies of various group reinforcement procedures; 5) motivating parent participation in educational activities through various reinforcement procedures. The Rehabilitation Institute offers an independent graduate degree program in Behavior Modification. Two of the Behavior Modification Program faculty are jointly appointed at the Behavior Research Laboratory, Anna State Hospital, Anna, Illinois, and a portion of the research effort through that Laboratory is directed at problems in special education and elementary classrooms. Also, through the Rehabilitation Institute's Employment Training Center, a developmental workshop, projects are under way examining aspects of basic and continuing adult education. The majority of the educational

research effort of the Behavior Modification Program faculty is in areas subsumed under classroom management, curriculum development, and special problems in education. The primary thrust of the Design Department has been in implementing behaviorally based higher education programs in their curriculum.

With the support of the University, the various programs at SIU have established cooperative training and research activities with the following area educational facilities: elementary and secondary school systems; special education districts; and mental health, mental retardation, and correctional centers. Inquiries regarding specific training programs may be directed to the departments in which students or faculty have an interest.

Submitted by

Reed G. Williams
Guidance and Educational Psychology

Robert L. Campbell
Rehabilitation Institute

The Learning Research and Development Center

University of Pittsburgh

The Learning Research and Development Center was established at the University of Pittsburgh in 1964. It conceives of its mission as the establishment and maintenance of a unique relationship between research in learning and the development of improved instructional procedures and materials. Ongoing research in behavioral science serves to give direction to the Center's development of individualized instructional procedures, materials and teacher training. Evaluation, as a built-in component, occurs concurrently with program design and instrumentation.

Four major programs concern the staff at the present time: The Research and Development Program, the School Implementation Program, the Computer Services and Research Program and the Administrative and Research and Development Services Program. Most projects of a direct behavioral nature are to be found under the Research and Development Program; this includes studies in Classroom Management and in Children's Learning Research such as studies of reinforcers best able to maintain extended task oriented behavior in young children.

The earliest Center project was IPI (Individually Prescribed Instruction), a system of programmed elementary level education. It was initially concerned with reading and mathematics and subsequently with science, spelling, classroom management, computer management and measurement. Through the Philadelphia-based regional laboratory, Research for Better Schools, IPI began to have a direct national impact. In 1971-72, for example, over 50,000 elementary students used IPI mathematics and inspired many local attempts to individualize other subjects.

In 1967, LRDC began a second major effort, PEP (The Primary Education Project), which sought to develop an individualized program for pre-schoolers. IPI and PEP have been merged into an improved educational model for children ages 3-9, and grades K-3, which now also comprises one of the Follow-Through Models. The mission of the Research and Development Program and the School Implementation Program is to build on this merger and to develop model school environments which have the capability of adapting to individual student differences to maximize educational results. The design of educational systems by LRDC is based on the psychological and behavioral analysis of learning and instructional requirements in a wide variety of domains. However, the specific educational practices developed do not always resemble, on the surface, procedures commonly recognized as "behavior modification."

Senior Staff:

Robert Glaser is concerned particularly with faculty recruiting, Faculty and Senior Staff meetings, and University coordination. In addition, he serves as Chairman of the Executive Committee and the Committee of Program Directors.

William W. Cooley is on leave during 1972-73. He will be a Fellow at the Center for Advanced Studies in the Behavioral Sciences at Stanford University.

Lauren B. Resnick coordinates the Research and Development Matrix which includes all Center Projects directly involved in systematic research and development activities. Each project is categorized by the school-outcome and disciplinary component to which it is most closely related.

John O. Bolvin coordinates LRDC activities with the University's School of Education, the cooperating school systems, regional laboratories, and the community. He also serves as Director of the School Implementation Program.

Robert J. Fitzhugh directs the Computer Services and Research Program which is responsible for developing and providing computer services required by Center projects working in the areas of computer-assisted instruction, testing and management as well as projects engaged in on-line behavioral research.

John L. Yeager is Director of the Administrative and R & D Services Program.

A revised program structure was adopted in the Spring of 1972 to insure integration of the Center's research and development efforts. This new structure is as follows:

Research and Development Program: Lauren B. Resnick, Director

School Implementation Program: John O. Bolvin, Director

Computer Services and Research: Robert Fitzhugh, Director

Administrative and R and D Services: John L. Yeager, Director

Submitted by: Lauren B. Resnick

The University of Utah

Salt Lake City, Utah

University of Utah

Behavior modification activities at the University of Utah currently are spread over several departments and organizations, some of which are affiliated with the University and some of which are not. These include: The Bureau of Educational Research, The Center to Improve Learning and Instruction, The Department of Educational Psychology, The Psychology Department, and several units related to the Medical School at the University. Programs which are not formally a part of the University include Behavior Systems Corporation, the Veteran's Administration Hospital, three of the four largest school districts in the State, and the County and City Mental Health facilities.

Service, training and research programs include the "Study Systems" program for low achieving and minority university students, the development of personalized instruction techniques at the college level, studies of creative behaviors, the Children's Behavior Therapy Unit (Behavior Modification Training Center) for young disturbed, psychotic and retarded children, and several complete schools and additional classrooms covering preschool through junior high school level students, and providing service for various normal, disruptive, and special education populations including handicapped adolescents and adults, all maintained by the local school districts. Programs at the VAH using behavior modification include programs for chronic psychotics, drug and alcohol problems, and community work-adjustment and "half-way" house programs. Other behavior modification programs relate to Community mental health clincs, child psychiatry, community health, medical education, behavior therapy and counseling, and an early childhood education center.

University degree programs in the various departments cover applied behavior analysis in education, laboratory research (several labs of various

kinds are available, including several in school settings), operant child development, educational systems and technology, an undergraduate program emphasizing paraprofessional preparation, and other programs in operant research or behavior therapy. Interested students might do well to write both the Educational Psychology and the Psychology Departments, describing their specific interests.

In conjunction with the Nebraska Conference on Early Childhood Education, the Bureau of Educational Research conducts an institute to train college students (mostly post-baccalaureate) in evaluation techniques used in behavior modification programs. The Bureau also has a project to work with various departments in the Arts and Humanities to explore the applications of behavior analysis to these areas.

Behavior Systems Corporation, a private company whose staff are mostly affiliated with the University, is concerned with the design, development and implementation of behavior modification programs and training programs or written materials. BSC has done extensive work in the areas of juvenile delinquency, training of educational personnel, and the writing of teacher training materials, as well as commercial and industrial applications.

Some of the staff associated with the Utah group are Dr. Howard Sloane, Dr. Gabriel Della-Piana, Dr. David Born, Dr. Emily Herbert, Dr. Donna Gelfand, Dr. Sid Gelfand, Dr. Donald Hartmann, Dr. Gayle Gregersen, Dr. Julie Ralph, Dr. Everett Murdock, Dr. Larry Reynolds, and Dr. Dale Cannon, plus a large number of extremely competent and professional students.

Submitted by

Howard N. Sloane, Jr., Ph.D.
Professor of Educational Psychology

Florida State University

Tallahassee, Florida

Behavior Modification programs at Florida State University in Tallahassee, Florida involve both public and private institutions, graduate and undergraduate training, including the College of Arts and Sciences, the College of Education, and the School of Music. Behavior Modification at FSU is typified by (1) interagency training & involvement, (2) community service and (3) specialized research in applied behavior analysis in education. A critical aspect concerns the use of behavioral principles to promote the arrangement of an enviornment where "happy" as well as effective learning can take place.

The Florida State program combines teacher training with research to deliniate those precise aspects of teacher preparation which produce changes in teacher and student behaviors. FSU personnel have conducted over 45 workshops in Florida and eighteen other states during the past few years. This model for teacher training includes (1) observations of students and teachers prior to practicum involvement (2) specific training including presentation of behavioral skills which are first modeled and then practiced with video-tape feedback and (3) post workshop observations of teacher and student behavior. Currently, two-year followups have been completed on a number of teachers. It was found that those teachers who change from a primarily negative to positive mode of classroom interaction become self-reinforced and maintain the positive pattern. Students then learn, "to be nice people and take joy from learning". We have been able to document those precise activities in the training sequence which result in subsequent teacher changes from our experience in working with over 6,000 teachers during the past five years.

The above training and research provide an expandable, hierarchial model of training which allows the consultant "to work himself out of a job" and let the local school district personnel conduct all future training sessions. Dade County Public Schools represent the prototype which was used during the summer of 1970.

Dade County Public Schools chose approximately 35 counselors, teachers and administrators to participate. Dr. Charles H. Madsen, Jr. and Dr. Clifford K. Madsen assisted by 13 persons conducted an In-Service training workshop for these 35 personnel directed toward preparing them to conduct similar workshops with teachers in the county system. These teachers had recently been assigned to work in schools which had been integrated only a short time. This workshop was entitled "A Behavior Modification Workshop in Human Relations" and was designed to envolve the teachers and use practical techniques directed toward classroom management and human relations problems. [1.] Experience in practical application of acquired techniques within summer school classes (including video-taped analysis, theoretical discussions and role-playing) prepared participants to conduct similar workshops with other county personnel. Following the two-week workshop, data gathered by the 13 behavioral specialists and observers were analyzed and the 35 persons assigned on the basis of the data to teams of three. Each team trained 20-30 local teachers for a two-week period and repeated the procedure for an additional two-week workshop for another 20-30 teachers. The Madsen brothers and assistants correlated the training and assisted the Dade County personnel. The expansion model resulted in the training of over 750 teachers during the six-week time period. The local county personnel have also conducted over 15 additional workshop during the subsequent school year without additional assistance by using the materials and video-tape library developed at FSU.

1. Published in 1971 by Allyn and Bacon as A Workshop Manual for Teaching/Discipline: behavioral principles toward a positive approach. Companion volume to Teaching/Discipline: behavioral principles toward a positive approach, Allyn and Bacon, 1970. Expanded for parents as Children/Discipline: A Positive approach for parents, Allyn and Bacon, 1971

The heirarchical model includes many and diverse personnel from a variety of University departments in actual work in both local and distant school districts. Diagnostic functions are coordinated within the Humand Development Clinic, (Dr. D. Driggs, director) and include crises intervention available for local schools. Schools refer children and behavior modification specialists travel to the school observe the classroom and attempt to change the behavior of the classroom teacher or peers, and when appropriate, work with the parents.

. Cooperation among the School Psychology Training Program of Florida State University, Leon County Schools, and the School Psychology Program of the Leon County Mental Health Guidance Center is formalized as follows:

Graduate students who desire to participate are directly responsible to the director of the School Psychology Program of the Leon County Mental Health Guidance Center who, as a member of the faculty of the Department of Psychology of Florida State University, coordinates the training of graduate students in Leon County schools and is assisted by instructors on the School Psychology faculty who teach courses which are prerequisites to Leon County School placement. Graduate students who desire to participate function on three levels.

First year students are assigned to specific schools to complete a variety of psycho-educational tests concurrent with registration in Psy. 564 Weschler testing (Winter quarter 1st year) and Psy. 582 Psycho-education Diagnosis (Spring quarter 1st year-Weschler testing prerequisite to Psy. 582.). Students function under the director of school psychologists assigned to specific Leon County Schools.

Second year graduate students concurrently registered in Clinical Practicum 573-74-75 (School Psychology Section) are assigned to appropriate selected schools as Psychological Assistants to School Psychologists for ten hours per week and in addition carry, on campus, one case in the Human Development Clinic.

Second year students participate in teacher training, applied behavioral applications to social and academic behavior, organize and conduct token systems, behavioral groups, supervise the Department of Psychology Student Aid program student placement and/or other activities approved by appropriate personnel.

Third and/or fourth year graduate students are responsible to the Director and given appropriate duties and responsibilities (e.g. parents groups, behavioral and interracial groups, supervise testers and 1st and 2nd year students, conduct teacher training, assist in corrections of academic and social problem, community involvement programs).

Special research areas in addition to continual research in teacher involvement and change include: special "laboratory" studies helping children with severe behavioral problems, continual teacher consultations the use of undergraduates as teacher aides (approximately 250 students per quarter from educational psychology classes are assigned to work with teachers and devote approximately 24,000 hours per year in the local schools), studies on academic areas as reinforcers, refining of observational systems so they are both reliable and simple to use (training in observation is also part of the teacher training package), peer as tutors, accountability studies on the time use of teachers and pupil personnel services, video-tape feedback, modeling, the use of game centers, group versus individual contingencies, development of language in rural black youngsters, use of game and reinforcement centers, effectiveness of criterion testing in school subjects and classroom demonstrations of a variety of behavioral principles, the use of music to teach auditory discrimination as a prerequisite for reading and the use of music to reinforce other academic areas, and community action programs for rural black families to help themselves. The above indicate the major thrusts in research directed toward practical

educational programs. Faculty members include the following: C. H. Madsen, Jr., Jon Bailey, Dave Hoffman, Don Driggs, Richard Dunham and David Cuypers in the Department of Psychology, Clifford Madsen and Don Michel in the School of Music.

The University of Oregon

Eugene, Oregon

University of Oregon at Eugene

There are several nuclei of research and training in behavior modification here. The University houses three HEW-funded institutes: an Instructional Media Center developing behaviorally-based curriculum materials; a component of the National Resource Center Network; and a Research and Development Center sponsored by the Bureau of Education for the Handicapped which employs behavioral technology. The behavioral Becker-Engelmann Follow-Through Model recently relocated in Eugene. The Oregon Research Institute under Dr. Gerald Patterson has for several years dealt with alleviating the problems of deviant children through home training and training within the normal classroom. A school to prepare extremely disruptive children to return to their regular classrooms is operated by Dr. Hill Walker who also recently published a training manual for teachers. Preparation through the Ph.D. level with an emphasis on behavior modification is offered by the Department of Psychology and the College of Education.

BEHAVIOR MODIFICATION TRAINING AND RESEARCH ACTIVITIES ON THE UNIVERSITY OF OREGON CAMPUS

Training and research activities in the area of behavior modification at the University of Oregon are carried out in three primary settings. These are:

(1) The Special Education Department

(2) The Psychology Department

(3) Oregon Research Institute

The training program in special education is supported by grant monies from the Bureau of Education for the Handicapped. Master's level and doctoral level students are trained in the following areas: (a) mental retardation, (b) physically handicapping conditions, (c) emotional disturbance, (d) learning disabilities, (e) administration of special education.

The training program has a behavioral orientation, with an emphasis upon behavior modification, precision teaching, and the Becker-Engelmann approach to diagnosis and instructional programming. The department enrolls approximately 50 doctoral students and approximately 90 master's students per year. Introductory-intermediate courses in behavior modification are offered by Wes Becker and John Stamm.

There are a number of research projects and grants in the Special Education Department that use behavior modification techniques in their research and training activities. These include the Instructional Materials Center (Wayne Lance, Director), The Center for Research in the Behavioral Education of the Handicapped (Hill M. Walker, Director) and the Regional Resource Center (James Crosson, Director). The Instructional Materials Center provides services to field personnel in the area of instructional materials for handicapped children. The Center for Research in the Behavioral Education of the Handicapped conducts research on the development of standardized treatment procedures for subgroupings of deviant or deficient classroom behavior, e.g.,

acting-out, withdrawn, low study skills, disturbed peer relationships, etc. Major research personnel in this center are Joseph Cobb, Hyman Hops, and Hill M. Walker. The Regional Resource Center offers direct educational services to handicapped children enrolled in regular educational settings. An outreach approach is used in which diagnostic-prescriptive teams work with special educational personnel in field settings to deliver services to handicapped children.

The Psychology Department trains master's and doctoral level students in behavior modification through its clinical psychology program. The department maintains a psychology clinic in which psychological services are delivered to a range of clientele, e.g., children, adults, families from a variety of referral sources.

The department has a very active family therapy program in which students receive training in teaching parents to better manage their own children. The department also has several federally funded research projects in the area of behavior modification including a study of the analysis of conflict parameters in social interaction and a study of behavioral similarity and generalization across settings. Major personnel in the area of teaching and research in behavior modification are: William Sheppard, Stephen M. Johnson, Robert Weiss, Edward Lichtenstein, Benson Schaeffer, Joseph Lo Piccolo, Peter Lewinson, and Hal Arkowitz.

Oregon Research Institute is a university related private research corporation adjacent to the Oregon campus. The institute has a large

number of federal research grants and employs primarily mathematicians and psychologists.

ORI has a number of research grants in the area of social learning under the general direction of Gerald R. Patterson. The research ranges from basic to applied and is conducted primarily in home and school settings.

Areas of investigation include the aggressive child, family therapy, sequential analysis and research methodology in behavior modification, e.g. ipsative measures, observer bias, observer calibration and training, development of statistical models for the analysis of dependent data and reliability assessment. Students from both Psychology and Special Education receive training at ORI. Major research personnel are : Gerald R. Patterson, Richard Jones, John Reid, Joseph Cobb, and Roberta Ray.

Submitted by:

Hill M. Walker
Associate Professor
Department of Special Education
University of Oregon
Eugene, Oregon

The University of Washington

Seattle, Washington

University of Washington
Experimental Education Unit
Child Development and Mental Retardation Center

The Experimental Education Unit is one of four units in the Child Development and Mental Retardation Center at the University of Washington in Seattle. The Experimental Education Unit (EEU) relates directly to the Center and to the College of Education, and is directed by Dr. Norris G. Haring; the Associate Director is Dr. Alice H. Hayden. Key researchers at the Unit are Dr. Thomas C. Lovitt, Dr. James O. Smith, Dr. Dennis Mithaug, K. Eileen Allen, Jane Rieke, Valentine Dmitriev, and Dr. James W. Moss, Director of Development, Planning, and Evaluation. The Experimental Education Unit's overall objectives are three-fold:

Service to Children

1. To provide exemplary service programs for handicapped children from birth to 18 years of age and to offer support services and training for the parents of these children.
2. To communicate with school districts and other agencies on the placement, transfer, and follow-up of children served in Experimental Education Unit programs.
3. To assess the needs of each individual child admitted to the Experimental Education Unit School program, to develop behavioral objectives for each child's individualized program, and to maintain continuous measurement on his progress.
4. To return children as rapidly as possible to appropriate regular or special education placements in their home communities and to provide assistance to teachers receiving these children.
5. To collect follow-up information on the progress of children returned to community placements.

During 1971-72, the Experimental Education Unit served a total of 216 children and youth who came from twenty-three school districts in the Puget Sound area. An additional 346 pupils were served in off-campus cooperative programs with various school districts and with Head Start. There was extensive involvement of parents in Experimental Education Unit programs: a general Parent-Teacher meeting was held each quarter; there were 45 classroom staff-parent meetings; 1,178 individual parent conferences, 1,503 parent observations, and 22 parent volunteers serving for varying periods of time.

Training

1. To contribute to professional training programs in the College of Education at the undergraduate and graduate levels and to programs in other disciplines interested in the instruction and management of, and the improvement of services for, handicapped children.
2. To provide in-service training for staff members working at the Experimental Education Unit and to further the professional preparation of the staff through participation in advanced degree programs in Special Education.
3. To provide training for professionals and paraprofessionals working with handicapped children through Epton Day Care Center workshops funded through ESEA Title 1-89-313.
4. To provide intensive training for fourteen interns annually (graduate students in Special Education) who are funded through Experimental Education Unit projects and are assigned to specific classrooms within the Unit.
5. To cooperate with school districts in the provision of in-service training programs in field settings through intensive training programs at the Unit and workshops in various field settings.
6. To provide a first-class demonstration and practicum site for students on special assignments, including student teaching.

During 1971-72, 11,191 visitors came to the Unit from 36 different states and 17 countries. Staff members conducted or made presentations at 94 workshop or conference programs serving 9,159 participants. A total of 2,255 University students from 17 different disciplines received some part of their training at the Unit in special assignments, special projects, student teaching, seminars, and special workshops. A total of 646 students from 41 other four-year colleges, universities, and community colleges received some training at the Unit, and 169 students from 13 different high schools participated in sessions at the Experimental Education Unit.

Research

1. To refine procedures, test products (curricula, instructional materials, assessment and evaluation processes) and conduct research which has direct application for serving severely, moderately, and mildly handicapped children in a variety of field settings.
2. To develop replicable models for the improvement of instruction of handicapped children.
3. To disseminate rapidly information about effective procedures and research findings through workshops and through a variety of media such as publications, films, slide-tape sets, and videotapes.
4. To attain the specific behavioral objectives stated in measurable terms for each funded research project.

The Experimental Education Unit, through its Program Project (Dr. Norris G. Haring, Director; Coordinators, Dr. James O. Smith, Dr. Thomas C. Lovitt, and Mrs. Marie Eaton) and its Model Preschool Center for Handicapped Children (Dr. Alice H. Hayden, Project Director; Dr. Norris G. Haring, Co-Director; Coordinators, Mrs. K. Eileen Allen, Mrs. Jane Rieke, and Mrs. Valentine Dmitriev), is working toward the rapid dissemination of information and research findings to assist educators and special educators throughout the state to work toward planned change in achieving the goals and meeting the challenges presented by the new demands for the extension and improvement of services and educational programs for all handicapped children.

Staff members at the Unit had over 100 articles, case studies, chapters, books, or other materials published during the year. In addition, there are another 30 publications in press.

Staff members working in cooperation with personnel from the Media Center prepared over 30 audiovisual items including films, slide-tape sets, training packets, and videotapes for use in in-house training and field settings, for visitor presentations, and for field distribution to other programs. The Child Development and Mental Retardation Media Center now has a library of over 1,000 videotapes and 2,500 slides which makes it possible for staff members to use selected audiovisual materials for training purposes and for presentations at workshops and conferences.

The overall program of the EEU is aimed at increased cooperation with other CDMRC units and University departments in the training and research areas. For example, the Unit has been involved in a multidisciplinary program with young Down's syndrome children ages birth to 4. Another recent example is a multidisciplinary proposal to conduct a research project to study the various aspects of neurological impairment and its relationship to learning and behavior. Through a recent grant to the Child Development and Mental Retardation Center on developmental disabilities, there is also substantially increased cooperation with community colleges in an effort to replicate the services and training aspects of the EEU and the Clinical Training Unit. Further, there is an increased involvement in the preparation of professional and paraprofessional day care workers, Head Start personnel, and preschool teachers.

There is also greater recognition of the need for assistance in the development of "outreach" training and service programs in various types of field settings. At present, the Unit plans to assist in the establishment of several centers throughout the state as bases for providing in-service training for professional and paraprofessional personnel working with the handicapped in different types of service and educational programs.

Submitted by Dr. Norris G. Haring, Director
Experimental Education Unit
Child Development and Mental Retardation Center
University of Washington
Seattle, Washington 98195

STATE UNIVERSITY OF NEW YORK

AT STONY BROOK

STATE UNIVERSITY OF NEW YORK AT STONY BROOK
STONY BROOK, NEW YORK

Psychology Department

The Psychology Department has the following five major areas leading to a Ph.D: clinical, developmental, experimental, social, physiological. There are forty full-time faculty in psychology.

Clinical Division

Behavior modification training is the major forte of this program, and a strong research emphasis pervades the faculty.

The research, and academic activities of individual faculty related to behavior modification in educational settings include:

1. Dr. James Calhoun, Director, Psychological Services: Individualized and self-paced programmed courses with college students.

2. Dr. Ronald Kent (visiting): Methodological problems of naturalistic observation; clinical outcome research with young children with academic and social problems.

3. Dr. Daniel O'Leary, Coordinator, Child Psychological Clinic and Director of University Laboratory School (for children with emotional and academic problems): Research on token programs, generalization of behavior, methodological problems of naturalistic (classroom and home) observation, clinical outcome research with young children with academic and social problems. Author with his wife Susan of Classroom Management, The Successful Use of Behavior Modification, Pergamon, 1972.

4. Dr. Grover Whitehurst: Personalized Instruction with college students.

5. Dr. Marvin Goldfried: Teaching problem solving methods to cope with social problems, e.g., anxiety in college students using self-control projects.

6. Dr. Gerald Davison, President-elect of the American Association for the Advancement of Behavior Therapy: Research on cognitive factors in maintenance of behavior following drug induced change, on fear reduction in both animals and humans, and on cognitive factors in the amelioration of insomnia and homosexuality.

7. Dr. Robert Liebert: Research concerning reduction of children's fears of dentists and dogs through therapeutic use of symbolic modeling; co-author with John Neale and Emily Davidson of The Early Window, (Pergamon) which describes the adverse effects of television violence upon the young as well as the potential therapeutic effects that programs made in the laboratory might have; development of a language instruction via modeling package for severely and profoundly retarded children (has been used in Illinois, Tennessee and Ohio).

8. Dr. Leonard Krasner: Environmental designs of classrooms; a key writer about utilization of behavior principles in solving human problems (Ullmann and Krasner, Case Studies in Behavior Modification, 1965 and Ullmann and Krasner, A Psychological Approach to Abnormal Behavior, 1969).

9. Dr. Alan Ross, Director of the Clinical Psychology Program, past president of the Clinical Division of the APA and member of the American Board of Professional Psychology: research on the modification of sacadic eye movements of children with reading problems.

Subjects offered that relate to behavior analysis in education include: (a) behavior consultation with teachers, principles, and community mental health leaders; (b) development of educational programs ranging from those for children at the pre-school level to ones for prisoners in State reformatories; (c) participation in and supervision of undergraduates in a reading tutorial program, (d) personalized college-level instruction (e) enhancement of placebo value in interview situations, (f) basic operant animal research on choice value and self-control.

Submitted by,

K. Daniel O'Leary, Ph.D.
Psychology Department
State University of New York
at Stony Brook
Stony Brook, New York

DRAKE UNIVERSITY

DES MOINES, IOWA

Department of Psychology

Drake University

Des Moines, Iowa 50311

The Department of Psychology at Drake University is a recent addition to those graduate programs which offer training in applied behavior analysis. Three full-time faculty members and two adjunct professors make up the core of the behavior modification training staff.

Dr. Jon Krapfl has conducted research in automated desensitization and is currently involved in efforts concerned with the use of behavior modification in physical therapy and in applied research involving cost per behavior change analysis in behavior modification programming with the retarded, as well as research on token economies.

Dr. W. Scott Wood is interested in the analysis of verbal behavior. His applied research has been primarily on the analysis of academic performance at the college level as well as at elementary and secondary levels. In addition, Wood is planning an infant research program in the fall and Krapfl and Wood are now in the process of establishing a bio-feedback laboratory to study self-control.

Dr. Margaret Lloyd has conducted basic research on concurrent schedules and behavioral contrast. Her applied research interests are in hyperactive children and the language problems of the autistic child.

Elaine Burgess, M.A., is a staff member in Drake's counseling center. She has conducted research on the treatment of depression and anxiety problems using behavior therapy techniques. Dr. Donald Carr is Coordinator of Psychological Services for the Polk County Board of Education, and his research interests are in the analysis and improvement of student behavior in the public schools.

PROGRAM

The Psychology Department currently offers M.A. degrees in both Behavior Modification and School Psychology. The core of both programs is a sequence of content courses and applied work in behavior analysis. Planned program development involves the addition of an M.S. in Behavior Modification as a professional degree, developing five-year joint B.A.-M.A. programs for all behavior modification degrees, and switching from hour requirements to an individualized curriculum stressing modular programming and student progress based upon competency. A doctoral program is being developed and will emphasize behavioral systems design and evaluation. Additionally, there is an increasing expansion of undergraduate psychology service courses presenting the behavioral perspective.

STUDENT SUPPORT

The Department of Psychology has a number of teaching and research assistantships available for incoming graduate students. In addition, second year graduate students and new students with behavior modification experience are eligible for assistantships provided by surrounding school systems, hospitals, and clinics.

INSTRUCTIONAL METHODOLOGY

Course Design: The Psychology Department is developing individualized courses for several content areas based primarily on the suggestions of Keller and Michael. For example, a team of faculty, graduate, and undergraduate students administer an individualized course for approximately 1500 students a year in Introductory Psychology. The program is completely modularized with a learning center located in a resident's dormitory and available to students 40 hours a week for individualized assessment and tutoring. Several other psychology courses utilize this same format, but for smaller classes.

Practicum Supervision: Since a significant portion of Drake's graduate training in applied behavior analysis consists of practicum experiences, the behavior modification programs rely on the use of advanced students to supervise the newer, less experienced students, both graduate and undergraduate. This provides not only for an expanded training program, but also gives the advanced student valuable administrative and teaching experience.

UNIVERSITY RELATIONS

Several departments within the university have expressed interest in individualized courses and some classes have been redesigned upon the model of Introductory Psychology. The Psychology Department supports Drake's growing interest in behavioral instructional systems by serving as a resource for curriculum design and evaluation. The Psychology Department also provides several behavioral courses intended for special interest audiences. For example, the course "Introduction to Behavioral Engineering" provides introductory applied behavior analysis concepts for graduate students in the College of Education.

COMMUNITY PROGRAMS

The Center for Human Development: Drake has recently established the Center for Human Development to serve as a training and demonstration center for behavior analysis with handicapped children. Treatment is carried out in the center as well as in the homes of handicapped children. In addition, there is a consultation service which travels throughout Iowa conducting workshops and providing consultation in the use of behavioral principles. Workshops also

are conducted at the Center for Human Development for professional groups interested in the use of behavior modification.

The Center for Human Development is the primary facility for training our graduate students who participate in all phases of the programming offered by the center.

Off-Campus Community Programs: The Psychology Department has established working relations with a number of off-campus agencies and facilities which have agreed to provide training experiences for our students in return for behavior modification services. Several programs are in operation at Woodward State Hospital-School, an institution for retarded children, the Newton School System, in Newton, Iowa, and the Prescribed Activity Center, a pre-school for retarded children in Des Moines.

Junior Colleges: The behavior modification staff is aiding several junior colleges in developing behavior technology degrees in such fields as mental health, mental retardation, and child care. In addition to increasing the number of applied behavioral programs within Iowa, these junior college programs will also serve as sources of future students for Drake's advanced degree programs. Additionally, graduate students from the Psychology Department often teach service courses in applied behavior analysis for junior colleges in the area.

Public Education: The behavior modification staff works cooperatively with several local and state educational agencies. The nature of these interactions is exemplified by a summer workshop for state school psychologists that is jointly taught by the behavior modification staff, members of the Iowa Department of Public Instruction, and school psychologists from the Polk County School System. The course is offered for graduate credit through the Drake University summer school.

State Planning for Behavior Modification: A statewide conference to examine the implications of applied behavior analysis for Iowa will be held this year. The conference will be jointly sponsored by the Center for Human Development and the Iowa Department of Public Instruction. There will be involvement from behavior modification specialists in public and higher education, private practice, business and industry, and state and federal administrative agencies. An effort will be made to forge a more cooperative bond among such groups for the purpose of establishing more deliberate planning and evaluation of behavioral intervention programs in Iowa.

W. Scott Wood

Jon E. Krapfl

INDIVIDUAL LEARNING SYSTEMS

SAN RAFAEL, CALIFORNIA

15. INDIVIDUAL LEARNING SYSTEMS, SAN RAFAEL, CALIFORNIA

Individual Learning Systems (ILS) provides the nucleus for a group of research psychologists who have been active in the field of programmed instruction and behavioral education procedures for more than ten years. The principals of this group are Dr. Lloyd Homme, Dr. Donald Tosti, John Loehr, Dr. Kathleen Speeth, and Dr. James Evans.

Homme and Tosti recently authored a book entitled Behavior Technology: Contingency Management and Motivation, dealing with behavior management approaches in education, and presented in a format suitable for a behavior-managed classroom. Learning Is Getting Easier by Tosti and S. R. Wilson, is a compendium of classroom practices currently employed in behavior-managed programs.

The term "Contingency Management" was coined by Tosti to describe the approach they used in an early project in motivating low achieving adolescents to learn from programmed materials. Homme's work in coverant control therapy and self-management is well known.

These developmental efforts led to the design of specific prototype operations based on the contingency management system. The Capitol Job Corps Center, operated by Westinghouse under Tosti, was the major experimental center for Job Corps. It also served as the basic model for a first major USOE-funded teacher-training project in contingency contracting (1966) and was subsequently applied by Loehr in a delinquency rehabilitation project at the Karl Holton School for Boys. The performance contractors looked to the Capitol Center model for their institutional strategies. The contingency management design was successfully used in 2 pre-school and Educational Achievement Center programs that have been duplicated by others.

The ILS personnel take the position that if the technology of behavior modification is to have widespread effects, it must result in economically profitable "products." To achieve this, ILS is divided into six operational clusters: General Administration and Planning, Educational Systems Analysis and Evaluation Group, Self-Instructional Materials Development Group, Behavior Modification and Research Group, Graphics, Media and Production Group and Marketing and Distribution.

The present state of activity by the ILS group includes:

1. Development and publication of individualized college courses being used by 100,000 students in 13 subject areas. These include College Composition, Psychological Statistics, Behavior Technology, Introductory Sociology, Physical Anthropology, Fundamentals of Mathematics, Pre-Calculus, and U.S. History.
2. Development and operation of college teacher-training workshops with a cumulative enrollment of 3000 to date.
3. Founding and operation of a non-profit behaviorally-based K-12 individualized school housed in geodesic domes near San Francisco Bay.
4. Consulting, training and program management with local, State, and Federal educational agencies, as well as several unique applications of reinforcement principles to the solution of actual critical business problems for commercial clients.
5. The application of contingency management principles to teach self-management, love, joy and self-esteem to pre-school and elementary school children.

6. The design of peer-tutor procedures, whereby students who are slightly more advanced in the subject area can aid and monitor the performance of their fellow students.
7. The continued production of PI multi-level, multi-media training materials for the U.S. Postal Service, the State of California, the State of New York and others.

Submitted by
Donald Tosti, Ph.D.
and John Lochr